```
Minimum
Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Run
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DB seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          protein search, using sw model
                  A_Geneseq_19Jun03:*
1: /SIDS1/gcgdata/gen
2: /SIDS1/gcgdata/gen
3: /SIDS1/gcgdata/gen
4: /SIDS1/gcgdata/gen
5: /SIDS1/gcgdata/gen
6: /SIDS1/gcgdata/gen
6: /SIDS1/gcgdata/gen
9: /SIDS1/gcgdata/gen
10: /SIDS1/gcgdata/gen
11: /SIDS1/gcgdata/gen
11: /SIDS1/gcgdata/gen
12: /SIDS1/gcgdata/gen
13: /SIDS1/gcgdata/gen
14: /SIDS1/gcgdata/gen
15: /SIDS1/gcgdata/gen
16: /SIDS1/gcgdata/gen
17: /SIDS1/gcgdata/gen
18: /SIDS1/gcgdata/gen
19: /SIDS1/gcgdata/gen
20: /SIDS1/gcgdata/gen
21: /SIDS1/gcgdata/gen
22: /SIDS1/gcgdata/gen
23: /SIDS1/gcgdata/gen
24: /SIDS1/gcgdata/gen
25: /SIDS1/gcgdata/gen
26: /SIDS1/gcgdata/gen
27: /SIDS1/gcgdata/gen
28: /SIDS1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-941-947A-2
2284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1107863 seqs, 158726573 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 January 29, 2004, 14:06:57;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Minimum Match 0%
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Listing
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA199.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA200.DAT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DVVTWPYHLTADIRFCHWFF.....FNSMLSEIGQ?KGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          /SIDS1/gcgdata/geneseq/geneseqp-emb1/AA1984.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA1985.DAT:*
/SIDS1/gcgdata/geneseq/geneseqp-emb1/AA1986.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  / סבריבו granta/geneseq/geneseqp-embl/AA1981.DAT:*
/SIDS1/grogdata/geneseq/geneseqp-embl/AA1982.DAT:*
/SIDS1/grogdata/geneseq/geneseqp-embl/AA1983.DAT:*
/SIDS1/groddata/geneseq/geneseqp-embl/AA1983.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           /SIDS1/gcgdata/geneseq/geneseqp-embl
/SIDS1/gcgdata/geneseq/geneseqp-embl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Match 100%
first 45 s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             /gcgdata/geneseq/geneseqp-embl/AA1980.DAT:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; Search time 46 Seconds
(without alignments)
1507.902 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1107863
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /AA1987.DAT:*
/AA1988.DAT:*
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

		*				
Result	Score	Query Match Length DB	ength	BB	ID	Description
1	2284	100.0	437	23	ABG61553	High growth methan
2	2284	100.0	437	23	AAE22299	Methylomonas 16a s
w	2284	100.0	437	23	ABB09168	Methylomonas pyrop
4	1442	63.1	410	22	AAU45865	Propionibacterium
ຫ	282	12.3	488	23	ABB93840	Herbicidally activ
6	281.5	12.3	485	21	AAG39480	Arabidopsis thalia
7	270	11.8	483	16	AAR71580	Flaveria brownii f
œ	269.5	11.8	469	16	AAR71581	Oryza sativa fruct
w	263	11.5	426	16	AAR71583	Raphanus sativus f

	1PR91839	ů	463		0
Novel human diagno	96	22	795	•	
SIS		21	342		205
G	AAW11298	18	781	-	206.5
dif	073	24	780	•	210
lamblia PE	23	21	544	9.2	210.5
ptococc	N	23	340	•	211
Zea mays fruc		16	522	•	211.5
 pneumoniae 	ABU01294	24	335		215
Streptococcus	ABP81576	24	335	•	215
Streptococcus	ABP27458	23	337		216
Enterococcus		22	320		218.5
Zea mays protein f	AAG35420	21	375		219.5
abidopsi		21	353	٠	220.5
Streptococcus pneu	AAU37753	22	335	9.7	221
actococcu		23	340	•	222
a		22	322	•	222.5
Staphylococcus	-1	22	322		222.5
Staphylococcu		22	322		222.5
Herbicidally	ABB93734	23	444		226.5
Staphylococcus epi		23	345	9.9	226.5
Klebsiella pneumon	d)	22	320		226.5
Propionibacterium	42	22	462	0	232
		23	525		234
bidopsis	AAG47222	21	509	0	234
E. coli cellular		22	320	0	238.5
318	AAG28968	21	4.89	0	239
Arabidopsis t		2 <u>1</u>	462		239
Saimonella ty		22	320	0	240.5
Herbicidally activ	w	23	462	0	243
Arabidopsis t	3	N	366	0	247
Arabidopsis thali	AAG36437	2	537		251
Υ,	314	23	473	1.	251
Arabidopsis thali	AAG36438	21	473	1	251
Υſ	ABB93109	23	500		257.5
•					4

ALIGNMENTS

	- 2
6	Ж
G	U
σ	
14	ь
(J)	H
S	
ω	-

ABG61553 standard; Protein; 437 AA.

27-AUG-2002 (first entry)

High growth methanotrophic bacterial strain polypeptide #3

ammonia; nitrate; nitrite; nitrogen; pigment; oxygen; landfill; methane-containing environment; waste water treatment system; isoprenoid; nitrous oxide; terpenoid; animal feed; carotenoid; exopolysaccharide. High growth methanotrophic bacterial strain; C1 carbon substrate; enzyme; methane; methanol; Embden-Meyerhof carbon flux pathway; 16s RNA; pyrophosphate dependent phosphofrutokinase; nitrogen-containing compound; methane-containing environment; nitrous oxide; terpenoid; anima

Methylomonas sp.

WO200220728-A2.

14-MAR-2002

28-AUG-2001; 2001WO-US26827.

01-SEP-2000; 2000US-229858P.

(DUPO) DU PONT DE NEMOURS & CO E I.

Koffas M, Odom JM, Schenzle A;

WPI; 2002-452200/48

```
gene coding a pyrophosphate dependent phosphofrutckinase enzyme or a 16s CR NAA. The bacterial strain is useful for the production of single cell protein and for the biotransformation of a nitrogen-containing compound, ce.g. ammonia, nitrate, nitrite or nitrogen. It is also useful for the production of a feed production of a feed production of a feed production of a feed product comprising a protein, carbohydrates and a pigment and for reducing oxygen demand, for removing nitrates and contrites in methane-containing environments such as landfills, waste water treatment systems or anywhere that methane, oxygen and nitrates are present. The bacterial strain of the invention can be used as a canded with methane or methanol as a carbon source. It is also used in the production of biomass including proteins, carbohydrates and a wide variety of pigments (particularly for isoprenoid pigments for the purpose of generating animal feeds), in production of terpenoid and carbonacd compounds, useful as pigments and as monomers in polymeric materials and in production of exopolysaccharides at high levels.

Sequences ABG61591 ABG61590 represent high growth methanotrophic bacterial strain proteins of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New high growth methanotrophic bacterial strain, useful for producing single cell proteins, grows on a C1 carbon substrate, and comprises a functional gene encoding in Embden-Meyerhof carbon pathway -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The invention relates to a high growth methanotrophic bacterial strain, which grows on a C1 carbon substrate e.g. methane and methanol, and comprises a functional Embden-Meyerhof carbon flux pathway comprising a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                                       421
                                                                                                               361
                                                                                                                                                                      361
                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                        301
                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                       241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
   421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ABK83232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GLVKEGEDÞOKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                           MLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                         EAIVAEMQAKGQEVPRDAFGHIKUDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DVVTWPYHLTADIRECHWEFLNENEYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Page 85-87; 157pp; English
   MLSEIGQPKGGKVEVSH
                                                                                                               NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                         NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                 EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLV
                                                                                                                                                                                                                                                                                                                                                   KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                     KILDRAEWLPEIGITRESYEVHAVFVPEMAIDLEAEAKRIREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDINTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DVVTWPYHLTADIRFCHWFFLNFNFYTLMNXFKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          100.0%;
437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 2284; DB 23;
Pred. No. 2e-207;
; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     23;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               168
168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                                                   300
                                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       180
                                                                                                                                                                                                                                    360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0
```

RESULT 2 AAE22299 ID AAE2 XX

AAB22299

standard;

Protein;

437

밁

DNDVFFIKQSLGAWTAAEQGARYFYNVVAENNANFRMLIVHEVMGRNCGWLTAATAQEYR

Ś 멼 Ś Ś g á 밁 Ş ij Ś 벍 S

밁 S B

```
δ
                                  멼
                                                            Ş
                                                                                            밁
                                                                                                                     á
                                                                                                                                                  8
                                                                                                                                                                                                                                                                      5
                                                                                                                                                                                                                                                                                                          The invention relates to a method for producing carotenoid compounds.

Comparison of transformed metabolising host cell, comprising controlled levels of isopenteryl pyrophosphate and a nucleic acid molecule concording an enzyme in the carotenoid biosynthetic pathway, under the control of regulatory sequences, and contacting the host cell with carbon compounds to produce a carotenoid compound. The method is useful for control of regulatory sequences, and contacting the host cell with carbon compound of the carotenoid compounds such as antheraxanthin and astaxanthin, by using microorganism having a nucleic acid molecule encoding enzymes in the carotenoid biosynthetic pathway and which metabolise single carbon cubstrates. The carotenoids have potent anti-oxidant properties useful in the carotenoids in the synthesis of steroids flavours and fragrances and compounds for potential electro-optic applications. The present sequence is Methylomonas 16a sp. phosphofructokinase pyrophosphate dependent
                                                                                                                                                                                                                            Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Producing carotenoid compounds e.g. antheraxanthin and astaxanthin, by using microorganisms having a nucleic acid molecule encoding enzymes in the carotenoid biosynthetic pathway and which metabolize single carbon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Brzostowicz PC, Cher
Odom JM, Picataggio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Carotenoid; isopentenyl pyrophosphate; antheraxanthin; astaxanthin; diet; anti-oxidant; steroid; flavour; fragrance; electro-optic application; aquaculture; enzyme; phosphofructokinase pyrophosphate.
                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-SEP-2000; 2000US-229858P
01-SEP-2000; 2000US-229907P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        04-SEP-2001; 2001WO-US27420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       07-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                25-JUL-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAE22299;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Methylomonas 16a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Methylomonas 16a sp. phosphofructokinase pyrophosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (DUPO)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2002-351711/38.
      181
                                     121
                                                                121
                                                                                             5
                                                                                                                                                                                                              437;
                                                                                                                        5
                                                                                                                                                                       1 DVVTWPYHLTADIRFCHWFFINFNFYTLANKPKKVAILTAGGLAPCLNSAIGSLIERYTS
                                                                                                                                                                                                                                                                                                    used in the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뭠
                                                                                                                                                                                                                             Similarity
                                                                                                          IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQREGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Page
DNDVFPIKQSLGAWIAAEQGARYEMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                     GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                       DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                     GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADI
                                                                                             IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                      437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PONT
                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      104-106; 156pp; English
                                                                                                                                                                                                                                                                      À
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DE NEMOURS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Cheng Q
uggio SK,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                entry)
                                                                                                                                                                                                                          100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ó
                                                                                                                                                                                                                            . 0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Rouviere
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Dicosimo DJ,
Couviere PE;
                                                                                                                                                                                                              0
                                                                                                                                                                                                              Score 2284; DB 2
Pred. No. 2e-207;
; Mismatches 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Koffas
                                                                                                                                                                                                                                        23;
                                                                                                                                                                                                               0
                                                                                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Miller
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     dependent
                                                                                                                                                                                                                                             437;
                                                                                                                                                                                                               o
,.
                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             αi τη
γα
                                                                                                                                                                                                                                                                                                                                                                                                                                                   carbon
                                        180
                                                                   180
                                                                                                120
                                                                                                                           120
                                                                                                                                                         60
                                                                                                                                                                                     60
                                                                                                                                                                                                                                                                                                                                                                               μį
                                                                                                                                                                                                                                                                                                                                                                                                                         á
```

```
RESULT 3
ABB09168
AN ABB0
AN AN ABB0
A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               음 중
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Methylomonas; methanotropic; carbon metabolism; carbon flux pathw transaldolase; fructose bisphosphate aldolase; KHG/KDFG aldolase; pyrophosphate dependent phosphofructokinase; phosphofucomutase; glucose 6 phosphate isomerase; 6-phosphogluconate dehydratase; meglucose 6 phosphate 1 dehydrogenase; enzyme; methanotroph; methanglucose 6 phosphate 1 dehydrogenase; enzyme; methanotroph; methanologicose 6 phosphate 1 dehydrogenase; enzyme; enzyme; enzyme; enzyme; enzyme; enzyme; enzyme; enzyme; enzyme; 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              single carbon substrate; single cell protein; polysaccharide; thickener; isoprenoid; carotenoid pigment.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Methylomonas sp.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-JUL-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        utilized
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          01-SEP-2000; 2000US-229906P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    28-AUG-2001; 2001WO-US26730
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200220796-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Methylomonas pyrophosphate dependent phosphofructokinase SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ABB09168 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Odna)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       polynucleotide encoding a Methylomonas sp. carbon flux enzyme ful for altering carbon flow through methanotrophic bacteria, lized for production of single cell protein and commercially uable polysaccharides -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2002-362250/39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                먑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ABL51513.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MLSBIGQPKGGKVEVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NVDDMRLIKSCADLAVBCAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLLDRABWLPELGLTRES YEVHAVFVPEMA I DLEABAKRLREVMDKVDCVNI FVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            BAIVABMOAKGOEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KLLDRABWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Odom
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PONT DE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Į.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NEMOURS & CO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Norton KC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ye
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     찙
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            flux pathway;
G aldolase; fo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     methanol;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ID NO:16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      methane;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           feed;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     300
```

```
문
                     S
                                                         뮍
                                                                               Ś
                                                                                                              밁
                                                                                                                                          S
                                                                                                                                                                             ₽
                                                                                                                                                                                                           S
                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                                                           ₽
                                                                                                                                                                                                                                                                                                                                                                                                5
                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  នននននននន្ត្
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (iii) expressed in an antisense orientation; or (iv) disrupted by insertion of foreign DNA into the coding region. The manipulated methanotrophs are useful for the energy efficient conversion of single carbon substrates such as methane and methanol to commercially useful products in the food, feed and materials industries, and preferably for the production of single cell protein, and for producing polysaccharides, used as thickeners in food and non-food industries, and isoprenoid compounds and carotenoid pigments of various carbon lengths. The present sequence represents a Methylomonas pyrophosphate dependent phosphofructokinase from the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Seguence
421
                            421
                                                           361
                                                                                         361
                                                                                                                        301
                                                                                                                                                    301
                                                                                                                                                                                    241
                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                181
                                                                                                                                                                                                                                                                                                                                            121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     437;
                                                                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                       51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                               NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                   GI_VKEGEDPQKVAADQLVKDGVDIIHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                          DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
MISEIGOPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                            GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                            EAIVAEMQAKGQEVPRDAPGHIKLDAVNPGKWFGEQPAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                 DNDVFPIKQSLGAWTAABQGARYPMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                          MLSEIGOPKGGKVEVSH
                                                           NVDDWRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKFFNIDTDWFNS
                                                                                                                        EATVAEMQAKGQEVPRDAFGHIKLDAVNPGKWPGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                    KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEABAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                      KLIDRAEWLPELGITRESYEVHAVFVPEMAIDIEAEAKRIREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                     DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                       IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                        DVVTWPYHLTADIRFCHWFFLMFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                           IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ₹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  100.0%;
                             437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score
Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2284; DB 2
No. 2e-207;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0
                                                                                                                                                                                                                     300
                                                                                              420
                                                                                                                                                         360
                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                  240
                                                                                                                                                                                                                                                                                                               180
                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                          120
                                                                                                                                                                                                                                                                                                                                                                                                                                          6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       60
                                                                420
                                                                                                                           360
                                                                                                                                                                                         300
```

The present invention describes isolated polynucleotides (I) encoding a Methylomonas sp. carbon flux enzyme, consisting of: transaldolase; fructose bisphosphate aldolase; KMG/KDNG aldolase; phosphosplucomutase; pyrophosphate dependent phosphofructokinase; glucose 6 phosphate 1 isomerase; 6-phosphoglucomate dehydratase; and glucose 6 phosphate 1 dehydrogenase enzymes. (I) overexpression is useful for altering carbon flow through a methanotrophic bacteria, where the bacteria grows on a C1 carbon substrate of methane and methanol, and comprises a functional mmbden-Meyerhof carbon pathway comprising a gene encoding a pyrophosphate dependent phosphofructokinase enzyme, where the bacteria is preferably wethylomonas 16a American Type Culture Collection (ATCC) PTA 2402, and where the Carbon flux gene is: (i) over-expressed on a multicopy plasmid; (ii) operably linked to an inducible or regulated promoter; RESULT 4
AAU4586
ID AAU4
XX
AAU4
AC AAU4
XX
XX
AAU4
DT 27-F
CX
BE Prop
XX
SAPH
KW uvei
KW infif
KW infif
KW derm
XX
OS Prop
XX
WC20
XX
PFO
XX
PTO
ZO AAU4
XX
PFO
ZO AAU4
XX
PFO
ZO AAU4
XX
ZO AAU4
XX
ZO AAU4
ZO AAU4 SAPHO syndrome; synovitis; acne; pustulosis; hypertosis; osteomyelitis; uveitis; endophthalmitis; bone; joint; central nervous system; ELISA; inflammatory lesion; acne vulgaris; enzyme linked immunosorbent assay; dermatological; osteopathic; neuroprotectant. WO200181581-A2 Propionibacterium Propionibacterium 27-FEB-2002 AAU45865;

AAU45865 standard; Protein; 410

Ž,

(first

entry)

acnes immunogenic

protein #6761

20-APR-2001; 2001WO-US12865

4.

Page 66-68; 73pp; English

```
8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  문
                                                                                밁
                                                                                                                        Ś
                                                                                                                                                                   В
                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                         В
                                                                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                               5
                                                                                                                                                                                                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CC polypeptides may be used as antipens in the production of antibodies contacting the anomal period consisting the anomal proteins. The proteins and their associated DNA sequences are used in CC P. acnes. The disorders include SAPHO syndrome (synovitis, acne, CC pustulosis, hypertosis and osteomyelitis), uveitis and endophthalmitis. CC P. acnes is also involved in infections of bone, joints and the central controls associated with acre vulgaris. A method for detecting the corresponding system, however it is particularly involved in the inflammatory consists associated with a binding against that binds to the proteins of the invention and determining the amount of bound protein in the sample. The constitution of an anomal control of bound protein in the sample of the invention consists of the invention and determining the amount of bound protein in the sample. The conspectation of antibodies con be used to convergulate expression and activity of P. acnes polypeptides and consequences are treat P. acnes infections. The antibodies can be used as consequent that proteins in the sample, by consequence data for this patent did not form part of the printed consequence data for this patent did not form at the printed consequence data for this patent did not form at the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence and the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for this patent did not form the printed consequence data for the printe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                21-APR-2000;
02-JUN-2000;
07-JUL-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Example 1; SEQ ID No 7060; 1069pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Propionibacterium acnes polypeptides and nucleic acids useful for vaccinating against and diagnosing infections, especially useful
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           L'maisonneuve
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (CORI-) CORIXA
375
                                                                                   315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               2001-616774/71
                                         393
                                                                                                                              333
                                                                                                                                                                                                                                                             195
                                                                                                                                                                        255
                                                                                                                                                                                                                                                                                                     213
                                                                                                                                                                                                                                                                                                                                                 135
                                                                                                                                                                                                                                                                                                                                                                                            153
                                                                                                                                                                                                                                                                                                                                                                                                                                    75
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ü
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                     NGNVLRAIBEPRIKGGKPFNIDTDWFNSMLSBIGQ 427
                                                                                                                                                                                                             LEAEAKRIREVMDKVDCVNIFVSEGAGVBAIVAEMQAKGQEVPRDAFGHIKIDAVNPGKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTABVRKK
NGDTLTNIAFDRIKGGKPFDTTQPWFTAMLSEIGQ 409
                                                                                   FGKQFADKLGAEKVMVQKSGYFSRSAASNEADLELIGRCTDLAVDCALAGKTGVIGQDEE
                                                                                                                                                                                                                                                           SGSRMLIVHEVMGRNCGWLTAATAAKYREWLDTQQWLPEIGLSKKAWDVHAVYVPEAHID
                                                                                                                                                                                                                                                                                                                                                 TNTTAADLAAYLAENNYGLTVVGLPKTIDNDVVPIRQSLGAWTAAEQGSRFAQNIVGEHN
                                                                                                                                                                                                                                                                                                                                                                          TNTAAADLAAFLARNNYGLTVIGLFKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                                                    ASILKRFGGSPIGNSRVKLINAADLVKRGLVAEGDDPLKVAADRLVADGVDILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGVLQRPGGSVIGNSRVKLTNVXDCVKRGLVKEGEDPQKVAADQLVXDGVDILHTIGGDD
                                                                                                                            FGEOFAQMIGAEKTIVOKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  acne vulgaris
                                                                                                                                                                      LEAEAARLNKVMDEVGNVTIFLSEGAGLDAIIBEMEKDGQEVPRDPFGHVKLDKVNPGAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KKVALLTAGGFAPCLSTAISGLIQRYTBVAPBVEIIAYKHGYEGLLKGDFLEVTDTVRKN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAU39105-AAU68017 represent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                2000US-199047P.
2000US-208841P.
2000US-216747P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Persing DH, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   63.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mitcham JL, Wang
, Jen S, Carter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1442; DB 22;
Pred. No. le-127;
4; Mismatches 70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Propionibacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Wang
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ä
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SS,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          especially useful for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bhatia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               acnes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      410;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ç
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                              392
                                                                                                                                                                                                                  332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                       374
                                                                                                                                                                                                                                                           254
                                                                                                                                                                                                                                                                                                       272
                                                                                                                                                                                                                                                                                                                                                 194
                                                                                                                                                                                                                                                                                                                                                                                                                                    134
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0
```

```
RESULT 5
ABB9147 5
ABB92147 5
ABB9 31-M
AC ABB9
AC ABB
                                                    Ä
                                                                                                        ঠ
                                                                                                                                                                        몽
                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                       5
                                                                                                                                                                                                                                                                                                                                                                                              ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity
Matches 112; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The invention relates to identifying target proteins (ABB90790-ABB94016) for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant organisms using suitable search parameters, where plant sequences having an E-value greater by a factor of 3 than the E-value of most similar non-plant sequences are selected. The polypeptides or nucleic acids encoding them are useful for identifying modulators. The identified modulators are useful as herbicides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Identifying plant target proteins for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             organisms
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 2002-269010/31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Herbicidal; plant; agriculture;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Herbicidally active
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ABB93840;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ABB93840 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (FARB ) BAYER AG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200210210-A2
                                                                                                                                                                        250
                                                                                                                                                                                                                            206
                                                                                                                                                                                                                                                                                      190
                                                                                                                                                                                                                                                                                                                                             148
                                                                                                                                                                                                                                                                                                                                                                                                    150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5; SEQ ID NO 3051; 261pp + Sequence Listing; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                            88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 7
                                                                                                                                                                                                                                                                                                                                                                                                    KY---VNDIHKRGGTIIGTSR-
                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVRKKAGVLQREGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHT
FGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRLIKSCADL
                                                          IPESPFYLEGEGGLFEFIERRLKDHGHWV----IVLAEGAGQDLMCKSMES----TPMDA
                                                                                                                                                                        HVEAESNENGIGFV--KLMGRYSGYIA----
                                                                                                                                                                                                                            NVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVF
                                                                                                                                                                                                                                                                                                                                    IGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYF--M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IVTCGGLCPGLNTVIREVVSSLSYMYGVKRILGIDVSL-----GGYRGFYAKNTIPLNS
                                                                                                              VPEMAIDLEARA-----KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ILTAGGLAPCLNSAIGSL-----IERYTEIDPSIEIICYRGGYKGLLLGDSYPVTA
                                                                                                                                                                                                                                                                                      iggdgtorgasvifeeirrrrlkvavvgipktidndipvidksfgfdtaveeaorainaa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Weidler
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entry
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12.3%; Score 282; DB 2
26.8%; Pred. No. 1e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  488
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               herbicide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ID NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23,
                                                                                                                                                                           ------MYATLASRDVDCCL
                                                                                                                                                                                                                                                                                                                                                                                                       -GGHDTNKI-VDSIQDRGINQVYI 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 488;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                    318
                                                                                                                                                                           288
                                                                                                                                                                                                                                                                                            249
                                                             340
                                                                                                                                                                                                                                  265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      87
```

18;

Bob 341
LOUN-CALLAGE LOUN
16-JUN-1999 17-JUN-1999 18-JUN-1999 1903-0 18-JUN-19
908.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.

```
먑
                S
                                       Query Match
Best Local S
Matches 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   12-AUG-1999
13-AUG-1999
13-AUG-1999
16-AUG-1999
17-AUG-1999
18-AUG-1999
20-AUG-1999
20-AUG-1999
23-AUG-1999
23-AUG-1999
25-AUG-1999
25-AUG-1999
26-AUG-1999
27-AUG-1999
27-AUG-1999
27-AUG-1999
27-AUG-1999
                                                                                                                  31-AUG-1999
07-SEP-1999
17-SEP-1999
18-SEP-1999
18-SEP-1999
28-SEP-1999
28-SEP-1999
28-SEP-1999
28-SEP-1999
29-SEP-1999
29-SEP-1999
29-SEP-1999
29-SEP-1999
21-OCT-1999
11-OCT-1999
                                                                             28-OCT-1999;
28-OCT-1999;
28-OCT-1999;
29-OCT-1999;
                    37
                                        109;
 96
                                                Similarity
 IVTCGGLCEGLNTVIREVVSSLSYMYGVKRILGIDGGYRGFYAKNTIFLNSKV---VNDI 152
                   ILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                       Conservative
                                                                                                                                                                   9903-0153070

9903-0153788

9903-0154018

9903-0154039

9903-0155486

9903-0155659

9903-015659

9903-015659

9903-0157117

9903-0158029

9903-0158029

9903-0158029

9903-0158232

9903-0159294

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159293

9903-0159688

9903-0160761

9903-0160761

9903-0160814

9903-0160814

9903-0160819

9903-0160819
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99US-0148341.
99US-014868.
99US-0149368.
99US-0149722.
99US-0149722.
99US-0149722.
99US-0149723.
99US-0149902.
99US-0149902.
99US-0150666.
99US-0151066.
99US-0151066.
99US-0151080.
99US-0151080.
99US-0151080.
99US-0151080.
99US-0151080.
99US-0151080.
                                                                            99US-0161405.
99US-0161306.
99US-0161359.
99US-0161361.
99US-0161361.
99US-016192.
99US-0161992.
99US-0161993.
99US-0161993.
                                                12.3%;
                                        61;
                                    Score 281.5; DB 21;
Pred. No. 1.1e-17;
1; Mismatches 166;
                                        Indels
                                                          Length
                                                          485;
                                      73;
                                      Gaps
                    96
                                       16;
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                       The amino acid sequence of the novel ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme (EC 2.7.1.11, PFX) encoded by the Flaveria brownii gene PFX-FBI. Plants transformed with these genes can express the enzyme. The transformed plants can produce varieties that have altered sugar content on storage at low temperatures. (Updated on 25-MAR-2003 to correct PN field.)
                                                                                                                                 DNA coding for fructose-6-phosphate 1-phosphotransferase plant origin, for prodn. of transformant plant cells with sugar content
                                                                                                                                                                                                                                                                                                                                                                                          ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme; potato; Solanum tuberosum; rice; Oryxa sativa; maize; Zea mays; Raphanus sativus; Flaveria brownii, primer; expression vector; Raphanus sativus; Flaveria brownii, primer; expression vector; Agrobacterium tumefaciens; sugar; storage; temperature.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAR71580;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAR71580
                                                                                                                                                                                                                                                                                                                                                                    Flaveria brownii.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Plaveria brownii fructose-6-phosphate 1-phosphotransferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               25-MAR-2003
11-OCT-1995
                                                                                                            Claim
                                                                                                                                                                                                                      Ніуовhі Т,
                                                                                                                                                                                                                                                                       19-AUG-1993;
                                                                                                                                                                                                                                                                                             16-AUG-1994;
                                                                                                                                                                                                                                                                                                                     23-FEB-1995.
                                                                                                                                                                                                                                                                                                                                             WO9505457-A1.
                                                                                                                                                                                                                                              (NISB ) JAPAN
                                                                                                                                                                                   1995-098757/13.
DB; AAQ85983.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  153
                                                                                                           ė,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        97
                                                                                                           Page 39-43; 79pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NPGKWFGEQFAQMIGAEKTLVO----KSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GIGFV -- KLMGRYSGYIA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGYTGYTSGLVNGR-QTYIPFYRITETQNNVVITDRMWAR-LLSSTNQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SGVIGHDED--NGNVLRAIEFPRIKGGKPFNIDTD--WFNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GEGGLFEFIERRLKDHGHMV----IVLAEGAGQDLMCKSMES----TPMDASGNKLLKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AEA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPEMAIDLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYF--MNVVAENNAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GLWLSQSIKDHFKKNKWVMNLKYIDPTYMIRAVPSNASDNVYCTLLAQSAVHGAM---
                                                                                                                                                                                                                      Kasaoka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (updated)
(first entry)
                                                                                                                                                                                                                                              TOBACCO
                                                                                                                                                                                                                                                                                             94WO-JP01352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---- KRLREVMDKVDCVNI FVSEGAGVEAI VAEMQAKGQEVPRDAFGHI KLDAV
                                                                                                                                                                                                                                                                       93JP-0226454.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein;
                                                                                                                                                                                                                      ×
                                                                                                                                                                                                                                              INC.
                                                                                                                                                                                                                       Mine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           483
                                                                                                                                                                                                                      H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                      Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----MYATLASRDVDCCLIPESPFYLB
                                                                                                                                                                                                                      MJA,
                                                                                                                                                                                                                       Tyson
                                                                                                                                                                                                                        贸
                                                                                                                                                altered
                                                                                                                                                             õ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               428
                                                                                                                                                                                                                                                                                                                                                                                                                    plant;
radish;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             274
```

Sequence

483

Ä

DB 16;

Length 483;

```
ARESULT 8
AAR71518
ID AAR7
XX ATP
XX A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ñ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local 9
DNA coding for fructose-6-phosphate 1-phosphotransferase - of
plant origin, for prodm. of transformant plant cells with altered
sugar content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Oryza sativa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        25-MAR-2003
12-OCT-1995
                                                                                                                                                                             Hiyoshi T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Oryza
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                potato; Solanum tuberosum; rice; Oryza sativa; maize; Zea mays
Raphanus sativus; Flaveria brownii; primer; expression vector;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme;
                                                                                                                                                                                                                                                                               19-AUG-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                    WO9505457-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Agrobacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAR71581
                                                                                                                                                                                                                              (NISB)
                                                                                                                                                                                                                                                                                                                                16-AUG-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local
                                                                                                                            1995-098757/13.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           36
                                                                                                                                                                                                                              JAPAN TOBACCO INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                    AAQ85984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SGVIGHDED--NGNVLRAIEFPRIKGGKPFNIDTD--WFNSMLSBIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NGIGVVKLMGRYSGFIA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPEMAIDLEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GAAVIYQEVRRRGLKAVVAGIPKTIDNDIPVIDKSFGFDTAVEBAQRAINAAHVEAESAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IHKRGGTIIGTSR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AIVTCGGLCPGLNTVIREIVCALYHMYGVTKVLGIDGGYRGPYSKNTITLTPKV---VND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AGYTGFTSGLVNGR-QTYIPFNRITEKQNNVVITDRMWAR-LLSSTNQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GLWISDKIKAHFAKIPPMPITLKYIDPTYMIRAVPSNASDN---VYCTLLAQSCVHGVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGKWFGEQ----FAQMIGAEKTLVQ-KSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EGGLLEYVEKELKDDGHMV----IVVAEGAGQELLAAENLK--TSTAKDASGNKLLHDV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EA-----KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNT
                                                                                                                                                                           Kasaoka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  fructose-6-phophate 1-phosphotransferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (updated)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        tumefaciens; sugar; storage; temperature
                                                                                                                                                                                                                                                                               93JP-0226454
                                                                                                                                                                                                                                                                                                                                94WO-JP01352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note=
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Protein;
                                                                                                                                                                             ۳
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  *encoded by
                                                                                                                                                                             Mine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           469
                                                                                                                                                                             H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 270; DB 16;
Pred. No. 1.3e-16;
3; Mismatches 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ------GGHDKPKI-VDSIQDRGINQVYIIGGDGTQK 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ł,
                                                                                                                                                                             Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     codon
                                                                                                                                                                             MJA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ----MYATLASRDVDLCLIPESPFYLEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            175;
                                                                                                                                                                             Tyson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           95
```

```
δ
                                                                                                                                                                    Дb
                                                                                                                                                                                                S
                                                                                                                                                                                                                                     닭
                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                  片
                                                                                                                                                                                                                                                                                                                                Q
                                                                                                                                                                                                                                                                                                                                                                멎
                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      XXX0000000XX
                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The amino acid sequence of the novel ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme (BC 2.7.1.11; PPK) encoded by the Oryza sativa (rice) gene, pPFK-OS1, as given in the specification. Plants transformed with genes encoding PFK (see AAQ85982-86) can express the enzyme. The transformed plants can produce varieties that have altered sugar content on storage at low temperatures. (Updated on 25-MAR-2003 to correct PN field.)
AAR71583;
                            AAR71583
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 7; Page 46-49; 79pp; Japanese.
                                                                                                                                                                                                                                                                                                                                217
                                                                                                                                         385
                                                                                                                                                                         325
                                                                                                                                                                                                     329
                                                                                                                                                                                                                                       275
                                                                                                                                                                                                                                                                     277
                                                                                                                                                                                                                                                                                                  234
                                                                                                                                                                                                                                                                                                                                                                174
                                                                                                                                                                                                                                                                                                                                                                                               157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          37
                                                                                                                                                                                                                                                                                                                                                                                                                                                            97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          74
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                              standard;
                                                                                                           GFTVG--QVNGRHC-YIPFYRITEKQNKVSITDRMWAR-LLSSTNQP
                                                                                                                                       G-VIGHDEDNGNVLRAIEFPRI--KGGKPFNIDTDWFNSMLSEIGQP
                                                                                                                                                                                                                                     GGLFRYLEKRLKENGHMV----IVVAEGAGQKLINETKESMG----KDASGNSILLDV--
                                                                                                                                                                                                                                                                     A----KRLREVADKVDCVNIFVSEGAGVEAIVABMQAKGQBVPRDAFGH-IKLDAVN
                                                                                                                                                                                                                                                                                                   GIGLVKLMGRHSGFIA----HYATLASR---
                                                                                                                                                                                                                                                                                                                                 MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                            HKRGGTVLGTSR-------GGHDTMKI-VDSIQDRGINQVYVIGGDGTQRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                          QREGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDINTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IVTCGGLCPGLNTVIREIVCGLNDMYGVSRVLGIQGGYRGFYACNTIDLSP---KSVNDI
                                                                                                                                                                                                     PGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRLIKSCADLAVECAFRRES
                                                                                                                                                                                                                                                                                                                                                                 AGVIFEEIRRGLKVAVAGIPKTIDNDIPVIDRSFGFDTAVEEAQRAINAAHVEAGSAEN
                                                                                                                                                                                                                                                                                                                                                                                            AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKOSLGAWTAABQGARYFMNVVAENNANPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                                                                                                                                                         -GLWLSQKIKEHPKKIKTTINLKYIDPTYMIRAIPŚNASDNVYCTLLAHRVVHGAMAGYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A.
                              Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11.8%; Score 269.5; DB 16;
26.8%; Pred. No. 1.4e-16;
tive 57; Mismatches 172;
                              426
                              B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                     -DVDCCLIPESPFYLEGE
                                                                                                           426
                                                                                                                                           428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          69;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                           383
                                                                                                                                                                                                                                                                                                                                                                                                 216
                                                                                                                                                                                                         384
                                                                                                                                                                                                                                                                     328
                                                                                                                                                                                                                                                                                                     274
                                                                                                                                                                                                                                                                                                                                                                                                                               173
                                                                                                                                                                                                                                                                                                                                                                                                                                                              156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             130
                                                                                                                                                                                                                                       324
                                                                                                                                                                                                                                                                                                                                   276
                                                                                                                                                                                                                                                                                                                                                                 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            96
```

```
RRSULT 9
AAR71543
ID AAR7
XX AAR7
XX AAR7
XX AAR7
XX BABN
DT 12-0
XX Raph
XX ATP
XX ATP
XX ATP
XX ATP
XX AGP
XX AG
                                                                                               19-AUG-1993;
                                                                                                                                                                                                                                                                                                                    23-FEB-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Raphanus sativus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             potato; Solanum tuberosum;
Raphanus sativus; Flaveria
Agrobacterium tumefaciens;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Raphanus sativus fructose-6-phophate 1-phosphotransferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         25-MAR-2003
12-OCT-1995
                                                                                                                                                                                                         16-AUG-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                              WO9505457-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (updated)
(first en
                                                                                                    93JP-0226454
                                                                                                                                                                                                               94WO-JP01352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             rice; Oryza sativa; maize; 2 brownii; primer; expression sugar; storage; temperature.
```

Zea mays; vector;

plant; radish;

(NISB) JAPAN

TOBACCO INC

```
RESULT 10
ARR71579
ID ARR71
XX
XX
AC ARR71
XX
AC ARR71
XX
AC ARR71
XX
DT 11-OC
XX
DT Solan
XX
DT Solan
XX
DT Solan
XX
ATP-d
XW ATP-d
XW Rapha
KW Rapha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                     ð
                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뜅
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                    용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Sim
Matches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 199
N-PSDB;
                                              potato; Solanum tuberosum;
Raphanus sativus; Flaveria
Agrobacterium tumefaciens;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   The amino acid sequence of the novel ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme (SC 2.7.1.11; PFR) encoded by the Raphanus sativus (radish) gene, pPFK-RS1. Plants transformed with genes encoding PFK (see AAQ85982-86) can express the enzyme. The transformed plants can produce varieties that have altered sugar content on storage at low
                   Solanum tuberosum
                                                                                              ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme;
                                                                                                                            Solanum tuberosum fructose-6-phosphate 1-phosphotransferase
                                                                                                                                                          25-MAR-2003
11-OCT-1995
                                                                                                                                                                                                         AAR71579;
                                                                                                                                                                                                                                       AAR71579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 11; Page 58-61; 79pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNA coding for plant origin,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Hiyoshi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sugar content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (Updated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1995-098757/13
DB; AAQ85986.
                                                                                                                                                                                                                                                                                                                    356
                                                                                                                                                                                                                                                                                                                                                387
                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                                                                                                                                                                            330
                                                                                                                                                                                                                                                                                                                                                                                                                                             251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   107
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ы
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                       standard; Protein;
                                                                                                                                                                                                                                                                                                                    MAGYNGFTVGLVNGRHTYIPFYRITEKONKVVITDRMWAR-LLSSTNOPSFMKHDDHH 412
                                                                                                                                                                                                                                                                                                                                                I-GHDEDNGNVLRA----IEFPRI--KGGKPFNIDTDWFNSMLSEIGQPKGGKVBVSH
                                                                                                                                                                                                                                                                                                                                                                              GLWISQRIKDHFAKKWTLNLKYIDFTYMIRAVPSNASD----NVCCTLLAQSAVH---GV
                                                                                                                                                                                                                                                                                                                                                                                                            GKWFGEQFAQMIGAEKTIVQK---SGYFARASASNVDDMRLIKSCADLAVECAFRRESGV 386
                                                                                                                                                                                                                                                                                                                                                                                                                                             GGLFEFIGKRLKEIGHMV----IVIAEGAG-QDLLAESNEQSTTL-KDASGNKLLQDV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GIGLVKLMGRYSGFIAM-----YARLASR------DVDCCLIPESPFFLEGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAVIFEEIRRRGLKVAVAGIPKTIDNDIPIIDRSFGFDTAVEEAQRAINAAHVEATSFEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AADLAAFLARNNYGLTYIGLEKTVDNDVFEIKQSLGAWTAAEQGARYFMNVVAENNANER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HKRGGTILGTSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNIA 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IVTCGGLCPGLNTVIREIVCGLSYMYGVKKILGIEGGYRGFYARNTIDLDL----KTVNDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on 25-MAR-2003 to correct PN field.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----AKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNP 329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            426 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Kasaoka
                                                                                                                                                          (updated)
(first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             r fructose-6-phosphate 1-phosphotransferase - of for prodn. of transformant plant cells with altered
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ج
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.5%;
25.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mine
                                              rice; Oryza sativa; maize; Zea may8;
brownii; primer; expression vector;
sugar; storage; temperature.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            65:
                                                                                                                                                                                                                                         485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 263; DB 16;
Pred. No. 5.1e-16;
5; Mismatches 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          'n
                                                                                                                                                                                                                                       ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -GGHDTTKI-VDSIQDRGINQVYIIGGDGSQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MJA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Tyson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 426;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            품
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  encoding
                                                                                                                                                                                                                                                                                                                                                   437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        209
                                                                                                                                                                                                                                                                                                                                                                                355
                                                                                                                                                                                                                                                                                                                                                                                                                                             302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      216
```

```
밁
                        Q
                                                    밁
                                                                            Ş
                                                                                                            밁
                                                                                                                                  Ś
                                                                                                                                                                  밁
                                                                                                                                                                                            Ś
                                                                                                                                                                                                                        문
                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                문
                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                      맑
                                                                                                                                                                                                                                                                                                                                                                5
                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Beat
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The amino acid sequence of the novel ATP-dependent fructose-6-phosphate 1-phosphotransferase enzyme (BC 2.7.1.11; PFK) encoded by the potato (Solamum tuberosum) gene PFK32. The DNA sequence was isolated from a potato cDNA library using primers AAQ85987-91. The sequence was used to construct the plant expression vector pPFK(359) which was transformed into potato plants (Bintje variety) via Agrobacterium tumefaciens. The transformed plants can express the enzyme and produce plant varieties that have altered sugar content on storage at low temperatures. (Updated on 25-MAR-2003 to correct PN field.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNA coding for fructose-6-phosphate 1-phosphotransferase - of plant origin, for prodn. of transformant plant cells with altered sugar content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hiyoshi T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      19-AUG-1993;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 16-AUG-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              23-FBB-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WO9505457-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 4; Page 33-37; 79pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (NISB ) JAPAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1995-098757/13.
                                                                                                                                                                                                                                                                                 167
                            411
                                                       377
                                                                                  353
                                                                                                             323
                                                                                                                                       300
                                                                                                                                                                    272
                                                                                                                                                                                             247
                                                                                                                                                                                                                           226
                                                                                                                                                                                                                                                     187
                                                                                                                                                                                                                                                                                                           127
                                                                                                                                                                                                                                                                                                                                        126
                                                                                                                                                                                                                                                                                                                                                                                                                                                      al Similarity 25.
                                                                                                                                                                                                                                                                                                                                                       67 IICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEG
: |||:| : :| | : : ||:::|:||
                                                                                                                                                                                                                                                                                                                                                                                                 98
                                                                                                                                                                                                                                                                                                                                                                                                                          7 YHLTADIRECHWEFLNENEYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAQ85982
MVVITDRMWAR-LLSSTNOP
                           FNIDTD--WFNSMLSEIGOP
                                                                                  YFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED -- NGNVLRAIEFPRIKGGKP
                                                                                                                                       VEATVAE-MOAKGOEVERDAFGHIKLDAVNEGKWEGEQEAQMIGAEKTLVO-----KSG
                                                                                                                                                                                             EWLPELGLTRESYEVHAVFVPEMAIDLEAEA-----KRLREVMDKVDCVNIFVSEGAG
                                                                                                                                                                                                                                                     IKQSIGAMTAAEQGARYFMNVVABNNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRA
                                                                                                                                                                                                                                                                                HDTTKI-VDSIQDREINQVYIIGGDGTQKGAAVIYEEIRRRGLKVIVAGIPKTIDNDIPV
                                                                                                                                                                                                                                                                                                           EDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFP
                                                                                                                                                                                                                                                                                                                                        VFGIDGGYRGFYSKNIINLTP---KTVNDIHKRGGTILGSSR--
                                                                                                                                                                                                                                                                                                                                                                                                 YFSSDDVRAC-----
                                                         YMIRAVPSNASDN---VYCTLLAQSCVHGAMAGYTGETSGLVNGR-QTYIPFNRITEKQN
                                                                                                             QELLAEBNAHAKNEQ---DASGNKLLQDV--GLWISQKIRDHF-ATKTKMPITLKYIDPT
                                                                                                                                                                     ----MYATLASRDVDLCLIPESPFYLEGDGGLFEYIBKRLKENGHMV----IVIAEGAG
                                                                                                                                                                                                                           IDKSFGFDTAVERAQRAINAAHVEAESAENGIGVVKLMGRYSGFIA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               485
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kasaoka
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TOBACCO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      93JP-0226454
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 94WO-JP01352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ,×
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INC.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mine
                                                                                                                                                                                                                                                                                                                                                                                                                                                      56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Japanese
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 262; DB 16;
Pred. No. 7.8e-16;
6; Mismatches 179;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              'n
 451
                            428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Page MJA,
                                                                                                                                                                                                                                                                                                                                                                                                 IVTCGGLCPGLNTVIREIVHSLDYMYGVNK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tyson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 485;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                           ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                         432
                                                                                                                                           352
                                                                                                                                                                     322
                                                                                                                                                                                                  299
                                                                                                                                                                                                                             271
                                                                                                                                                                                                                                                        246
                                                                                                                                                                                                                                                                                                                                           166
                                                                                                                                                                                                                                                                                                                                                                       126
                                                                                                                                                                                                                                                                                                                                                                                                  125
                                                                                                                                                                                                                                                                                                                                                                                                                             99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                         17;
```

ABB93109 ID ABB9

ABB93109

standard;

Protein;

500

À

RESULT 11

```
XAXEXBXBXBXBXBXBXEXXXXXXBXBFFFXX8XDDDDDDDXX
                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                       맑
                           뮍
                                              Ś
                                                                           D)
                                                                                                            S
                                                                                                                                            &
                                                                                                                                                                Ś
                                                                                                                                                                                                    용
                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                            뭐
                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local S
Matches 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              The invention relates to identifying target proteins (ABB90790-ABB94016) for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant organisms using suitable search parameters, where plant sequences having an E-value greater by a factor of 3 than the E-value of most similar non-plant sequences are selected. The polypeptides or nucleic acids encoding them confining horbitales.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              organisms -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Identifying plant target proteins for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequence from plant with nucleic acid or amino acid sequences from non-plant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Herbicidal; plant; agriculture; herbicide
                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 5; SEQ ID NO 2320; 261pp + Sequence Listing; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Herbicidally active polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ABB93109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Tietjen K,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             28-AUG-2001; 2001WO-EP09892.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28-AUG-2001; 2001WO-EP09892.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        07-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO200210210-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       useful as herbicides
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (FARB )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2002-269010/31
368
                             345
                                                                                                                                            249
                                                                                                                                                                                                                                                               149 AKNTVSLDSKV---VNDIHKRGGTILGTSR---
                                                                                                                                                                                                                                                                                                                                                                                109;
                                                                                                                                                                                                                                                                                                                                                    37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BAYER AG
                                                                                                                                                                                                                                                                                                                                                                                              Similarity
IKSCADLAVECAFRRESGVIGHDEDNGNV---LRAIEFPRIKGGKFFNIDTD--WFNSML
                                                                                   RDVDCCLIPESPFYLEGEGGLFEYIEKKLKESGHMV----LVIAEGAGQDLMSKSMESM-
                                                                                                       QGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRES
                                                                                                                                                                                                                           KDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAE 198
                                                                                                                                                                                                                                                                                        LGDSYPVTAEVRKKAGVLQRFCGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLV 138
                                                                                                                                                                                                                                                                                                                                                   ILTAGGLAPCLNSAIGSL-----IERYTEIDPSIEIIC-----YRGGYKGLL
                           --TEKDASGNKLLKDV--GLWLSQSIKDHFNQKKMVMNLKYIDPTYMIRAVPSNASDNVY
                                                       QEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRL
                                                                                                                                            DRGINQVYIIGGDGTQRGASVIFEEIRRRGLKVAVIGIPKTIDNDIPVIDKSFGFDTAVE
                                                                                                                                                                                                                                                                                                                       IVTCGGLCPGLNTVIREIVSSLSYMYGVKRILGIDVS---PCDCNLLLTKTNTGGYRGFY 148
                                                                                                                                                                                                                                                                                                                                                                                                                                           500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Weidler
                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    3
                                                                                                                                                                                                                                                                                                                                                                              11.3%; Score 257.5; 25.6%; Pred. No. 2.26 tive 59; Mismatches
                                                                                                                                                                                                                                                                                                                                                                             59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQ ID NO 2320
                                                                                                                                                                                                                                                                                                                                                                                           ; DB 23; Length 500; 2e-15;
                                                                                                                                                                                                                                                                                                                                                                              167;
                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                               -GGHDTTKI-VDSIQ 188
                                                                                                                                                                                                                                                                                                                                                                              91,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          sequences
                                                                                                                                                                                                                                                                                                                                                                                Gaps
   422
                             400
                                                         367
                                                                                     344
                                                                                                                  311
                                                                                                                                              289
                                                                                                                                                                          258
                                                                                                                                                                                                      248
                                                                                                                                                                                                                                                                                                                                                    78
                                                                                                                                                                                                                                                                                                                                                                                16;
```

```
å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               昂
                                                                                                                                                    06-MAY-1999;
07-MAY-1999;
11-MAY-1999;
                                                                                                                                                                                                  28-APR-1999;
30-APR-1999;
30-APR-1999;
                                                                                                                                                                           05-MAY-1999
06-MAY-1999
                                                                                                                                                                                                                                                                                   25-MAR-1999
29-MAR-1999
                                                                                                                                                                                                                                                                                                                                         25-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                        06-SEP-2000
                                                                                                                                                                                                                                                                                                                                                                       BP1033405-A2
                                                                                                                                                                                                                                                                                                                                                                                     Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                    Protein identification; signal transduction pathway; metabolic pathway;
                                                                                                                                                                                                                                                                                                                                                                                                                                   Arabidopsis thaliana protein fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                  18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAG36438;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAG36438
                                                                                                                                                                                                                                       19-APR-1999
21-APR-1999
                                                                                                                                                                                                                                                                                                                          25-FEB-1999;
                                                                                                                                                                                                                                                                                                                                                                                                     termination
                                                                                                                                                                                                                                                                                                                                                                                                            hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                         23-APR-1999
                                                                                                                                                                                                                                 23-APR-1999
                                                                                                                                      -MAY-1999
                                                                                                                                              -MAY-1999
                                                                                                                                                                                                                                                                                                            -MAR-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       455
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   401
        4-1999
4-1999
                               I-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SSTNOP 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CTLLAQSAVHGAMAGYTGYI--
                                                                                                                                                                                                                                                                                                                                         2000EP-0301439
                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
               99US-0137528.
99US-0137502.
99US-0137724.
99US-0138094.
99US-0138540.
                                                                  99US-0134221
99US-0134376.
99US-0134941.
99US-0135124.
99US-0135124.
99US-0135629.
99US-0136021.
99US-0136332.
                                                                                                                                                                   99US-0132485.
99US-0132486.
99US-0132487.
                                                                                                                                                                                          99US-0132048.
99US-0132407.
99US-0132484.
                                                                                                                                                                                                                         99US-0130449.
99US-0130510.
99US-0130891.
                                                                                                                                                                                                                                               99US-0128714.
99US-0129845.
99US-0130077.
                                                                                                                                     99US-0134218
99US-0134219
                                                                                                                                                     99US-0132863
99US-0134256
                                                                                                                                                                                                                 99US-0131449
                                                                                                                                                                                                                                                                      99US-0127462
99US-0128234
                                                                                                                                                                                                                                                                                             9908-0126264
                                                                                                                                                                                                                                                                                                    9905-0125788
                                                                                                                                                                                                                                                                                                                          9905-0121825
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Protein;
         3-0138540.
3-0138847.
                                                     -0137222
                                                                                                                                                                                                                                                                                                                   -0123180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   --SGLVNGRQTYIPFYRITEKQNHVVITDRMWAR-LL
                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQ ID
                                                                                                                                                                                                                                                                                                                                                                                                                                     ő
                                                                                                                                                                                                                                                                                                                                                                                                                                    44655
```

-0139119

```
뮹
                      Ś
                                                                                               Query Match
Best Local Sim
Matches 103;
                                                                                           13-SEP 1999
15-SEP 1999
16-SEP 1999
20-SEP 1999
23-SEP 1999
23-SEP 1999
24-SEP 1999
24-SEP 1999
28-SEP 1999
29-SEP 1999
21-OCT 1999
22-OCT 1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12-AUG-1999
13-AUG-1999
13-AUG-1999
16-AUG-1999
17-AUG-1999
20-AUG-1999
20-AUG-1999
20-AUG-1999
23-AUG-1999
23-AUG-1999
23-AUG-1999
25-AUG-1999
27-AUG-1999
27-AUG-1999
31-AUG-1999
h
Similarity 25.:
03; Conservative
                                                                                           99US-0148341
99US-0148482
99US-0149723
99US-0149929
99US-0149929
99US-0150866
99US-01510866
99US-01510866
99US-01510866
99US-01510866
99US-01510866
99US-01510866
99US-01513739
99US-01513739
99US-01513739
99US-0151448
99US-01514018
99US-01601401
99US-0161401
                                                         24
                                             60;
                                              Score 251; DB 21;
Pred. No. 8.2e-15;
50; Mismatches 174;
                                                                      Length
                                               Indels
                                                                       473;
                                              72;
                                               Gaps
     153
                          96
                                               15
```

16-JWN 1999
11-JWN 1999
12-JWN 1999
22-JWN 1999
23-JWN 1999
24-JWN 1999
24-JWN 1999
25-JWN 1999
26-JWN 1999
27-JWN 1999
11-JWN 1999
11-JWN

9918-013452
9918-013453
9918-0139456
9918-0139456
9918-0139456
9918-0139460
9918-0139460
9918-0139462
9918-0139462
9918-0139462
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-014287
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140823
9918-0140832
9918-0140832
9918-0140833
9918-0140833
9918-0140833
9918-0140838
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088
9918-014088

1.

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ð
                                         suitable search parameters, where plant sequences having an E-value greater by a factor of 3 than the E-value of most similar non-plant sequences are selected. The polymeptides or nucleic acids encoding them are useful for identifying modulators. The identified modulators are
                                                                                             The invention relates to identifying target proteins (ABB90790-ABB94016) for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant organisms using
                                                                                                                                                                                              Identifying plant target proteins for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant organisms -
                                                                                                                                                                      Claim
                             useful as
                                                                                                                                                                                                                                                                      WPI; 2002-269010/31.
                                                                                                                                                                                                                                                                                                 Tietjen
                                                                                                                                                                                                                                                                                                                                                        28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                 28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                                               07-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Arabidopsis thaliana.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Herbicidal; plant; agriculture; herbicide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Herbicidally active polypeptide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      31-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ABB93145;
                                                                                                                                                                                                                                                                                                                           (FARB )
                                                                                                                                                                                                                                                                                                                                                                                                                                          WO200210210-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ABB93145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      154
                                                                                                                                                                  5; SEQ ID NO 2356; 261pp + Sequence Listing; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 217 MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97
                                                                                                                                                                                                                                                                                               ۳
                                                                                                                                                                                                                                                                                                                           BAYER AG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MAGYNGFTVGLVNGRHTYIPENRITEKQNKVVITDRMWAR-LLSSTNQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A-----KRLREVMDKVDCVNIFVSBGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GIGLVKLMGRYSGFIA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAAIFEEIRKRKLKVAVAGIPKTIDNDIPIIDRSFGFDTAVEBAQRAINAAHVEATSFEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HRSGGTILGTSR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           I-GHDEDNGNVLRA----IBPPRI--KGGKPFNIDTDWFNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GLWISQRIKDHFAKKWELTLKYIDFTYMIRAVPSNASD----NVCCTELAQSAVH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKWFGEQFAQMIGAEKTLVQK---SGYFARASASNVDDMRLIKSCADLAVECAFRRESGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GGLFEFIDKRIKESGHMV----IVIAEGÄGQDLLSESM--KESTTIKDÄSGNKLIQDI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTA 156
                             herbicides.
                                                                                                                                                                                                                                                                                                 Weidler
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                 X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            473
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             β
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -----GGHNTTKI-VDSIQDRGINQVYIIGGDGSQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO 2356.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----MHATLASRDVDCCLIPESPFFLEGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         છું:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   196
```

Query Match

.0%

Score

251;

DB 23;

Length

Sequence

473

AA:

```
문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  녆
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Similarity
19-APR-1999;
21-APR-1999;
23-APR-1999;
23-APR-1999;
28-APR-1999;
30-APR-1999;
30-APR-1999;
04-MAY-1999;
05-MAY-1999;
                                                                                             05-MAR-1999;
09-MAR-1999;
23-MAR-1999;
25-MAR-1999;
29-MAR-1999;
01-APR-1999;
06-APR-1999;
08-APR-1999;
16-APR-1999;
                                                                                                                                                                                           25-FEB-1999;
                                                                                                                                                                                                                 25-FBB-2000;
                                                                                                                                                                                                                                                          BP1033405-A2
                                                                                                                                                                                                                                                                                                                                                                                        AAG36437;
                                                                                                                                                                                                                                                                                                                                                                                                             AAG36437
                                                                                                                                                                                                                                                                               Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                            Arabidopsis thaliana protein
                                                                                                                                                                                                                                                                                                                                                                   18-OCT-2000
                                                                                                                                                                                                                                                                                                    termination
                                                                                                                                                                                                                                                                                                             hybridisation assay;
                                                                                                                                                                                                                                                                                                                          Protein identification; signal transduction pathway; metabolic pathway;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HRSGGTILGISR------GGHNTTKI-VDSIQDRGINQVYIIGGDGSQKG
                                                                                                                                                                                                                                                                                                                                                                                                           standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MAGYNGFTVGLVNGRHTYIPFNRITEKQNKVVITDRMWAR-LLSSTNQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A-----KRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GIGLVKLMGRYSGFIA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFWNVVAENNANPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    I-GHDEDNGNVLRA----IEFPRI--KGGKPFNIDTDWFNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GLWISQRIKDHFAKKMTLTLKYIDPTYMIRAVPSNASD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GKWFGBQFAQMIGAEKTLVQK---SGYFARASASNVDDMRLIKSCADLAVECAFRRESGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GGLFEFIDKRLKESGHMV----IVIAEGAGQDLLSESM--KESTTLKDASGNKLLQDI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MLIVHEVNGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAAIFEEIRKRKLKVAVAGIPKTIDNDIPIIDRSFGFDTAVEEAQRAINAAHVEATSFEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ILTAGGLAPCLNSAIGSLIERYTBIDPSIBIICYRGGYKGLLLGDSYPVTABVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IVTCĞĞLCPGLNTVIREIVCGLSYMYGVKRILGIDĞĞYRĞFYARNTIHLDL---KTVNDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                 2000EP-0301439
                                                                                                                                                                                                                                                                                                                                                                   (first
           99US-0131449.
99US-0132048.
99US-0132407.
99US-0132484.
                                                                                              99US-0128234.
99US-0128714.
99US-0129845.
                                                               99US-0130449.
99US-0130510.
                                                                                                                            99US-0126785
99US-0127462
                                                                                                                                                  99US-0125788
99US-0126264
                                                                                                                                                                       99US-0123180
99US-0123548
                                                      99US-0130891.
                                                                                      99US-0130077.
                                                                                                                                                                                             9908-0121825
                                                                                                                                                                                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              25.2%; -- 60;
                                                                                                                                                                                                                                                                                                                                                                   entry)
                                                                                                                                                                                                                                                                                                            genetic mapping;
                                                                                                                                                                                                                                                                                                                                                                                                           537
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pred. No. 8.2e-15;
0; Mismatches 174;
                                                                                                                                                                                                                                                                                                                                            fragment
                                                                                                                                                                                                                                                                                                                                                                                                             À
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -----MHATLASRDVDCCLIPESPFFLEGS
                                                                                                                                                                                                                                                                                                             gene expression control;
                                                                                                                                                                                                                                                                                                                                             SEQ ID
                                                                                                                                                                                                                                                                                                                                              NO: 44654
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          --NVCCTLLAQSAVH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   72;
                                                                                                                                                                                                                                                                                                              promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15
```

19-UUL-1999; 19-UUL-1999; 19-UUL-1999; 19-UUL-1999; 19-UUL-1999; 19-UUL-1999; 20-UUL-1999; 20-UUL-1999; 20-UUL-1999; 21-UUL-1999; 21-UUL-1999; 21-UUL-1999; 22-UUL-1999; 22-UUL-1999; 22-UUL-1999;	24 - JUN-1999; 28 - JUN-1999; 29 - JUN-1999; 30 - JUN-1999; 01 - JUL-1999; 01 - JUL-1999; 02 - JUL-1999; 06 - JUL-1999; 07 - JUL-1999; 08 - JUL-1999; 11 - JUL-1999;	ALV. 199	06-MAY-1999; 07-MAY-1999; 11-MAY-1999; 11-MAY-1999; 14-MAY-1999; 14-MAY-1999; 14-MAY-1999; 14-MAY-1999; 14-MAY-1999; 21-MAY-1999; 21-MAY-1999; 22-MAY-1999; 22-MAY-1999; 23-MAY-1999; 24-MAY-1999; 27-MAY-1999; 21-MAY-1999;
99US-0144331 99US-0144331 99US-0144333 99US-0144333 99US-0144334 99US-014435 99US-014435 99US-0144632 99US-0144814 99US-0145086 99US-0145086 99US-0145086 99US-0145085	99US-0140695 99US-0140823 99US-0141287 99US-0141287 99US-01412154 99US-0142154 99US-0142055 99US-0142390 99US-0142803 99US-0142803 99US-0142803 99US-0142803 99US-0144085 99US-0144085	99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013945 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013946 99US-013963	99US-0132486 99US-0132863 99US-0134256 99US-0134218 99US-0134221 99US-0134221 99US-0134768 99US-0134768 99US-0135124 99US-0135124 99US-0135124 99US-0135629 99US-0135629 99US-0136629 99US-0136782 99US-0137724 99US-0137724 99US-0137724 99US-0137724 99US-0138640
			· · · · · · · · · · · · · · · · · · ·
PR 13-0CT-1999 PR 13-0CT-1999 PR 13-0CT-1999 PR 13-0CT-1999 PR 14-0CT-1999 PR 14-0CT-1999 PR 14-0CT-1999 PR 14-0CT-1999 PR 14-0CT-1999 PR 14-0CT-1999 PR 21-0CT-1999 PR 21-0CT-1999 PR 21-0CT-1999 PR 21-0CT-1999 PR 21-0CT-1999	PR 10-SEP-1999 PR 10-SEP-1999 PR 10-SEP-1999 PR 15-SEP-1999 PR 20-SEP-1999 PR 20-SEP-1999 PR 23-SEP-1999 PR 24-SEP-1999 PR 29-SEP-1999 PR 29-SEP-1999 PR 05-OCT-1999 PR 07-OCT-1999 PR 08-OCT-1999 PR 08-OCT-1999 PR 08-OCT-1999	PR 11-AUG-1999; PR 11-AUG-1999; PR 11-AUG-1999; PR 13-AUG-1999; PR 16-AUG-1999; PR 16-AUG-1999; PR 16-AUG-1999; PR 20-AUG-1999; PR 20-AUG-1999; PR 20-AUG-1999; PR 20-AUG-1999; PR 20-AUG-1999; PR 27-AUG-1999; PR 27-AUG-1999	PR 22-JUL-1999 PR 23-JUL-1999 PR 23-JUL-1999 PR 23-JUL-1999 PR 26-JUL-1999 PR 27-JUL-1999 PR 27-JUL-1999 PR 27-JUL-1999 PR 27-JUL-1999 PR 27-JUL-1999 PR 02-AUG-1999 PR 03-AUG-1999 PR 04-AUG-1999 PR 04-AUG-1999 PR 04-AUG-1999 PR 05-AUG-1999 PR 05-AUG-1999 PR 06-AUG-1999
010 - 80.66 100 -	10 - SD66	10. Shife 10. Sh	99US-0145089 99US-0145145 99US-0145218 99US-0145218 99US-0145218 99US-0145218 99US-0145918 99US-0145918 99US-0145918 99US-0146386 99US-0146386 99US-0146386 99US-0147038 99US-0147303 99US-0147303 99US-0147303 99US-0147303 99US-0147303 99US-0147303 99US-0147303 99US-0147433 99US-0147433

```
RESULT 15
AAG3941
ID AAG39
XX AAG39
XX 18-OC
XX 18-OC
XX Prote
XX 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Sim
Matches 103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       21-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
22-OCT-1999
25-OCT-1999
26-OCT-1999
26-OCT-1999
26-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
28-OCT-1999
29-OCT-1999
    25-FEB-1999;
05-MAR-1999;
                                                                                                                    06-SEP-2000
                                                                                                                                                                                                                                                                     Protein identification; signal transduction pathway; metabolic pathway; hybridisation assay; genetic mapping; gene expression control; promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAG39481 standard;
                                                                       25-FEB-2000; 2000EP-0301439.
                                                                                                                                                               EP1033405-A2
                                                                                                                                                                                                          Arabidopsis thaliana
                                                                                                                                                                                                                                                    termination sequence
                                                                                                                                                                                                                                                                                                                                          Arabidopsis thaliana protein fragment SEQ ID NO: 48855.
                                                                                                                                                                                                                                                                                                                                                                                     18-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                    AAG39481;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  218
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           37 ILTAGGLAPCLNSAIGSLIERYTBIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MLIVHEVMGRNCGMLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HRSGGTILGTSR------GGHNTTKI-VDSIQDRGINQVYIIGGDSQKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            : | ::
MAGYNGFTVGLVNGRHTYIPFNRITEKONKVVITDRWWAR-LLSSTNOP 514
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GIGLVKLMGRYSGFIA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTA 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  I-GHDEDNGNVLRA----IEFPRI--KGGKPFNIDTDWFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLWISQRIKDHFAKKWTLTLKYIDPTYMIRAVPSNASD----NVCCTLLAQSAVH---GV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKWFGEQFAQMIGAEKTI.VQK---SGYFARASASNVDDMRLIKSCADI.AVECAFRRESGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAAIFEEIRKRKLKVAVAGIPKTIDNDIPIIDRSFGPDTAVEEAQRAINAAHVEATSFEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AADLAAFLARNNYGLTVIGLPKTVDNDVF?IKQSLGAWTAAEQGARYFMNVVAENNANPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99US-0160814
99US-0160980
99US-0160980
99US-0160981
99US-0161404
99US-0161405
99US-0161406
99US-016135
99US-0161360
99US-0161361
99US-0161361
99US-0161920
99US-0161920
99US-0161920
99US-0161920
99US-0161923
    99US-0121825.
99US-0123180.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.0%; Score 251; DB 21; 25.2%; Pred. No. 9.9e-15; tive 60; Mismatches 174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ξ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----MHATLASRDVDCCLIPESPFFLEGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 537;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     96
       18-UN-1999
19-UN-1999
20-UN-1999
20-UN-1999
00-UN-1999
01-UN-1999
00-UN-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        09-MAR-1999
23-MAR-1999
25-MAR-1999
25-MAR-1999
06-APR-1999
16-APR-1999
16-APR-1999
11-APR-1999
12-APR-1999
23-APR-1999
23-APR-1999
23-APR-1999
23-APR-1999
24-MAY-1999
30-APR-1999
30-APR-1999
30-APR-1999
14-MAY-1999
14-MAY-1999
11-MAY-1999
11-MAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16-JUN-1999;
16-JUN-1999;
17-JUN-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10-JUN-
114-JUN-
  99US-0138094
99US-0138847
99US-0139452
99US-0139453
99US-0139453
99US-0139456
99US-0139456
99US-0139459
99US-0139460
99US-0139461
99US-0139462
99US-0139763
99US-0139763
99US-0139763
99US-0139763
99US-0140823
99US-0140823
99US-0140823
99US-0140823
99US-0141842
99US-0142154
99US-0142154
99US-0142154
99US-0142280
99US-0142280
99US-0142280
99US-0142280
99US-0142280
99US-0142280
99US-0142280
99US-0142280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9908-013421

9908-013427

9908-013476

9908-013474

9908-013494

9908-013512

9908-013512

9908-01352

9908-01362

9908-01362

9908-01362

9908-013722

9908-013722

9908-013722

9908-013722
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99US-0127462.

99US-012834.

99US-0128945.

99US-012907.

99US-0130077.

99US-013010.

99US-013010.

99US-013011.

99US-0131449.

99US-0132407.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.

99US-0132486.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99US-0123548.
99US-0125788.
99US-0126264.
99US-0126785.
```

15-JUL-1999; 16-JUL-1999; 16-JUL-1999; 19-JUL-1999;

19-JUL-19-JUL-19-JUL-19-JUL-20-JUL-20-JUL-

9903-0144005.
9903-0144086.
9903-014425.
9903-0144321.
9903-014433.
9903-014433.
9903-014433.
9903-014433.

20-JUL-1999; 20-JUL-1999; 21-JUL-1999; 21-JUL-1999; 21-JUL-1999; 22-JUL-1999; 22-JUL-1999; 22-JUL-1999; 22-JUL-1999; 23-JUL-1999; 23-JUL-1999;

-SR66 -SR66 -SR66

S-0145036. S-0145088. S-0145085. S-0145087.

3-0145089. 3-0145192. 3-0145145. 3-0145218.

99US-0144632. 99US-0144884. 99US-0144814.

```
\times \t
                                                                                                          5
                                                                                                                                                             밁
                                                                                                                                                                                           S
                                                                                                                                                                                                                                           묽
                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                               δ
                                                                                                                                                                                                                                                                                                                                                                                                                                           Q
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            융
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              B
유 성
                                                                        片
                                                                                                                                                                                                                                                                                                                            片
                                                                                                                                                                                                                                                                                                                                                                                                           吊
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local S
Matches 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
21-0CT-1999
22-0CT-1999
22-0CT-1999
22-0CT-1999
25-0CT-1999
25-0CT-1999
26-0CT-1999
26-0CT-1999
26-0CT-1999
26-0CT-1999
28-0CT-1999
28-0CT-1999
28-0CT-1999
28-0CT-1999
29-0CT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        13-0CT-1
13-0CT-1
13-0CT-1
14-0CT-1
14-0CT-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       14-0CT
14-0CT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        06-0CI-
07-0CI-
12-0CI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    14-0CT-1999
                                                                              244
                                                                                                                                                                                                      286
300
                                                                                                                                                             194
                                                                                                                                                                                                                                              153
                                                                                                                                                                                                                                                                                     233
                                                                                                                                                                                                                                                                                                                                                                   175
                                                                                                                                                                                                                                                                                                                                                                                                                                                    115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            102;
                                                                                                                                                                                                                                                                                                                              95
                                                                                                                                                                                                                                                                                                                                                                                                             46
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                        AATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEA------KRLREVMD
                                                                                                                                                                                                                                                                                                                                                  GLPKTVDNDVFPIKQSLGAWTAAEQGARYF--MNVVAENNANPRKLIVHEVMGRNCGWLT

|:|||:||: | : ::|| | |::
                                                                                                                                                                                                                                                                                                                                                                                                           -----GHDTNKI-VDSIQDRGINQVYIIGGDGTQRGASVIFEBIRRRLKVAVV
                                                                                                                                                                                                                                                                                                                                                                                                                                       KDCVKRGLVKBGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVI
                                                                              MVMNLKYIDPTYMIRAVPSNASDNVYCTLLAQSAVHGAM---AGYTGYTSGLVNGR-QTY
                                                                                                                                                                                                                                                                                                                              GIPKTIDNDIPVIDKSPGFDTAVBEAQRAINAAHVEAESNENGIGFV--KLMGRYSGYIA
ISPPRIKGGKPPNIDTD--WPNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9908-015929

9908-0158232

9908-0158232

9908-0159294

9908-0159294

9908-015929

9908-0159330

9908-0159331

9908-0159638

9908-0160767

9908-0160767

9908-0160767

9908-0160768

9908-0160768

9908-016076

9908-016076

9908-016076

9908-016076

9908-016140

9908-016140

9908-016140

9908-016140

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135

9908-016135
                                                                                                                     KSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED--NGNVLRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        10.8%; Score 247; DB 21; 26.1%; Pred. No. 1.3e-14; :ive 56; Mismatches 151;
                                                                                                                                                                                                                                              -MYATLASRDVDCCLIPESPTYLEGEGGLFEFIERRLKDHGH
                                         428
  329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 366;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                  299
                                                                                                                          399
                                                                                                                                                                 243
                                                                                                                                                                                                                                                193
                                                                                                                                                                                                                                                                                       285
                                                                                                                                                                                                                                                                                                                              152
                                                                                                                                                                                                                                                                                                                                                                        232
                                                                                                                                                                                                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                      174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 17;
```

23-JUL-1999 26-JUL-1999 27-JUL-1999 27-JUL-1999 28-JUL-1999 28-JUL-1999 02-AUG-1999 02-AUG-1999 03-AUG-1999 05-AUG-1999 06-AUG-1999 10-AUG-1999 11-AUG-1999 11-AUG-1999 11-AUG-1999 11-AUG-1999 11-AUG-1999 12-AUG-1999 13-AUG-1999 13-AUG-1999 13-AUG-1999 14-AUG-1999 15-AUG-1999 16-AUG-1999 17-AUG-1999 18-AUG-1999 18-AUG-1999 18-AUG-1999 19-AUG-1999 11-AUG-1999 21-AUG-1999 22-AUG-1999 23-AUG-1999 24-AUG-1999 24-AUG-1999 24-AUG-1999 24-AUG-1999 25-AUG-1999 26-AUG-1999 27-AUG-1999 27-AUG-1999 28-SEP-1999 29-AUG-1999 21-SEP-1999 21-SEP-1999 21-SEP-1999 21-SEP-1999 22-SEP-1999 23-SEP-1999 24-SEP-1999 24-SEP-1999 25-SEP-1999 26-SEP-1999 27-AUG-1999 28-SEP-1999 29-SEP-1999 29-SEP-1999 29-SEP-1999 21-SEP-1999 21-SE

99US-0145224 99US-0145918 99US-0145918 99US-0145386 99US-0146388 99US-0146388 99US-0146388 99US-0147038 99US-0147303 99US-0147303 99US-0147192 99US-0147192 99US-0147416 99US-0147416 99US-0147416 99US-0148171 99US-0148171 99US-0149175 99US-0149175 99US-0149172 99US-0149172 99US-0149172 99US-0149172 99US-0149172 99US-0149173 99US-0149173 99US-0151066 99US-0151066 99US-0151066 99US-015303 99US-015303 99US-015303 99US-015303 99US-015306 99US-0154018 99US-015505 99US-015505 99US-015505 99US-0155659 99US-0156596

Search completed: January Job time : 48 secs 29, 2004, 14:36:32

S-0155139. S-0155486. S-0155659. S-0156458. S-0156596. S-0157117. S-0157753.

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Perfect score:
      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DB DB
    260.270
264.25
265.2215.5.5
2215.5.5
2215.5.5
2215.5.5
2215.5
2215.5
2215.5
2215.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
2315.5
231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      seq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            of hits satisfying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        length:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          length:
                                                                                                                                                                                                                                                                                                        100.0
11.8
11.5
11.5
11.4
9.9
9.3
9.3
7.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Issued_Patents_AA:*

1: /cgn2_6/ptodata/1/iaa/5A_COMB.pep:*

2: /cgn2_6/ptodata/1/iaa/5B_COMB.pep:*

3: /cgn2_6/ptodata/1/iaa/6A_COMB.pep:*

4: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*

5: /cgn2_6/ptodata/1/iaa/PCTUS_COMB.pep:*

6: /cgn2_6/ptodata/1/iaa/backfiles1.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             January 29, 2004, 14:35:42;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  328717 segs, 42310858 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-09-941-947A-2
      DVVTWPYHLTADIRFCHWFF.....FNSMLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20000000000
      GenCore version 5.1.6 (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        멾
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gapext 0.5
US-09-934-901-16
US-08-416-870C-4
US-08-416-870C-2
US-08-416-870C-2
US-08-416-870C-10
US-08-416-870C-10
US-09-134-001C-3774
US-09-107-532A-6470
US-09-198-452A-225
US-09-198-452A-180
US-09-198-452A-180
US-09-198-452A-180
US-09-198-452A-181
US-09-252-991A-30252
US-09-736-8515
US-09-736-8515
US-09-736-8515
US-09-736-8515
US-09-736-8516
US-09-736-8516
US-09-736-8516
US-09-736-8516
US-09-736-8516
US-09-736-8518-51
US-09-736-3618-11
US-09-736-3618-33350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              chosen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; Search time 21 Seconds (without alignments) 880.469 Million cell updates/sec
                                                                                                                                                                                                                                                                                Sequence 16, Appli
Sequence 4, Appli
Sequence 6, Appli
Sequence 2, Appli
Sequence 3774, Ap
Sequence 3774, Ap
Sequence 6470, Ap
Sequence 8, Appli
Sequence 225, Appli
Sequence 225, Appli
Sequence 2180, App
Sequence 4180, App
Sequence 458, App
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Description
                                                                                                                                    Sequence
Sequence
                                                                                                                                                                                                          Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                Sequence
                                                                              Sequence
                                                                                                                    Sequence
                                                                                                                                                                            Sequence
                                                                                                                                                                                            Sequence
                                                                            e 4, Appli

67, Appli

67, Appli

67, Appli

830252, Ap

81815, Ap

1815, Ap

1017, Ap

20048, Appl

26867, Ap

5684, Appl
    2, Appli
11, Appli
2, Appli
32350, A
                                      S
                                                                                                            Ó
                                                                                                                                                      문
                                                                                                                                                                                            S
                                                                                                                                                                                                                                  문
                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                B
```

93.5 4.1 5087 3 US-09-144-085-1 93.4.1 523 2 US-08-997-362-114 93.4.1 523 3 US-09-997-362-114 93.4.1 523 3 US-09-997-362-114 93.4.1 523 3 US-09-997-362-160 93.4.1 523 4 US-09-997-362-160 93.4.1 524 2 US-08-997-362-160 93.4.1 541 2 US-08-997-362-160 93.4.1 541 2 US-08-997-362-160 93.4.1 541 4 US-09-224-542-160 93.4.1 541 4 US-09-225-91A-31275 93.4.1 541 4 US-09-268-347-36 93.4.1 541 4 US-09-958-352-117 92.5 4.0 215 2 US-08-997-080-117 92.5 4.0 215 3 US-08-997-080-117	4. U	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	t
5087 5087 5087 5087 5087 5087 5087 5087	92.5	92.5	92.5	92.5	93	93	93	93	93	93	93	93	93	93	93	93	93.5	
. W X X X A A A X X X X A A A A X X X A A A X X X A A A A X X X A A A A A X X A	4.0	4.0	4.0	4.0	1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
3 US 09-144 085-1 2 US-08-997 080-114 2 US-08-997 362-114 2 US-09-995-855-114 3 US-09-95-855-114 4 US-09-324-542-114 4 US-09-324-542-160 2 US-08-997-362-160 2 US-08-997-362-160 2 US-09-95-855-160 4 US-09-324-542-160 4 US-09-252-991A-31275 4 US-09-252-991A-31275 4 US-09-268-347-3 5 US-08-997-080-117 9 US-09-95-855-117 9 US-09-95-855-117 9 US-09-997-362-117	215	215	215	215	2411	682	541	541	541	541	541	523	523	523	523	523	5087	,
US-09-144-085-1 US-08-997-080-114 US-08-997-362-114 US-09-095-855-114 US-09-095-855-114 US-09-324-542-114 US-09-97-362-160 US-08-997-362-160 US-08-997-362-160 US-09-284-542-160 US-09-285-347-36 US-09-285-347-36 US-09-285-347-36 US-08-997-362-117 US-09-09-855-117 US-09-09-855-117	Α.	ω	Ŋ	N	4.	4.	4.	4	w	Ŋ	N	4.	4	ω	Ŋ	Ņ	u	•
	US-09-324-542-117	US-09-095-855-117	US-08-997-362-117	US-08-997-080-117	US-09-268-347-36	US-09-252-991A-31275	US-09-205-426-160	US-09-324-542-160	US-09-095-855-160	US-08-997-362-160	US-08-997-080-160	US-09-205-426-114	US-09-324-542-114	US-09-095-855-114	US-08-997-362-114	US-08-997-080-114	US-09-144-085-1	

LIGNMENT

```
APPLICANT: Koffas, Mattheos
APPLICANT: Codom, J. Martin
APPLICANT: No. 655353ton, Kelley C.
APPLICANT: No. 655353ton, Kelley C.
APPLICANT: Ye, Rick
TITLE OF INVENTION: DENITRIFYING METHANOTROPHIC BACTERIAL STRAIN
FILE REPERENCE: CL1619 US NA
CURRENT APPLICATION NUMBER: US/09/934,901
CURRENT FILING DATE: 2001-08-22
PRIOR APPLICATION NUMBER: 60/229,906
PRIOR APPLICATION NUMBER: 60/229,906
PRIOR APPLICATION NUMBER: 60/229,906
PRIOR PRIOR SEG ID NOS: 20
NUMBER OF SEG ID NOS: 20
SOFTWARE: Microsoft Office 97
SEG ID NO 16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; LENGTH: 437
; TYPE: PRT
; ORGANISM: METHYLOMONAS
US-09-934-901-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 1
US-09-934-901-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 16, Application US/09934901 Patent No. 6555353 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local
301
                                             301
                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                     181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      atch 100.0%; Score 2284; DB 4; sal Similarity 100.0%; Pred. No. 3.8e-216; 437; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
                                                                                                                                                                                                                                                                                                                                                                                                                                       IDPSIBIICYRGGYKGLLLGDSYPVTABVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DVVTWPYHLTADIRFCHWFFILMFNFYTLMNKFKKVAILTAGGLAPCLNSAIGSLIERYTE 60
                                                                                                                                 KLLDRÆEWLPELGLTRESYEVHAVFVPEMAIDLEÆEAKKLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                             DNDVPPIKQSIGAWTAAEQGARYFMNVVAENNANPRMIIVHEVMGRNCGWITAATAQEYR
                                                                                                                                                                                                                                                                                                                                GLVKEGEDÞQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV 180
                                                                                                                                                                                                                                                                                                                                                                                                    IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
BAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                          BAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS 360
                                                                                                                                                                                                                                                                                                     GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                  DNDVFPIKQSIGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                 KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0
                                                                                                                                                 300
                                                                                                                                                                                                                                                     240
                                                                                                                                                                                                                                                                                                                                                                                                      120
360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                    240
```

```
Ś
                                                           ₽
                                                                                           Ś
                                                                                                                                     ď
                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                      仔
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    US-08-416-870C-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 2
                                                                                                                                                                                                                                                                                                                                                                                   US-08-416-870C-4
                                                                                                                                                                                                                                                                                                                                                                                                  INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
LENGTH: 483 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                  Best Local Similarity
Matches 113; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Patent No.
                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NAME: MURPHY JR, GERALD M
REGISTRATION NUMBER: 769.777
REFERENCE/DOCKET NUMBER: 760-
TELECOMMUNICATION INFORMATION:
TELEPHONE: (703) 205-8000
TELEPAX: (703) 205-8050
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: MINE, TOSHIKI
APPLICANT: KASACKA, KEISUKE
APPLICANT: TYSON, ROBERT HUW
APPLICANT: TYSON, ROBERT HUW
APPLICANT: PAGE, ANTHONY MILES JOHN
TITLE OF INVENTION: DNA ENCODING ATP-DEPENDENT FRUCTOSE 6-PHOSPHATE
TITLE OF INVENTION: 1-PHOSPHOTRANSFERASE ORIGINATING FROM PLANT, RECOMBINANT VECTOR
TITLE OF INVENTION: SAME AND METHOD FOR CHANGING SUGAR CONTENT IN PLANT CELLS UNDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STREET: PO BOX 74
CITY: FALL CHURCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               582486
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     361
216 RMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEA 275 : | : | | : | | : | | | | |
                                                                                                                                         152
                                                           195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           INFORMATION:
                                                                                                                                                                                                                                                            36
                                                                                                                                                                                96
                                                                                                                                                                                                                      95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22040-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MLSEIGOPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFFRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NVDDMRLIKSCADLAVECAFRRESGVÍGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MLSEIGQPKGGKVEVSH 437
                                                                                                                                         IHKRGGTIIGTSR
                                                           GAAVIYQEVRRRGLKAVVAGIPKTIDNDIPVIDKSFGFDTAVEBAQRAINAAHVEAESAE 254
                                                                                               AAADLAAFLARMWYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMWVVAEMNANP 215
                                                                                                                                                                           LQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNT 155
                                                                                                                                                                                                                      AIVTCGGLCPGLNTVÍRBIVCALYHMYGVTKVLGIDGGYRGFYSKNTITLTPKV---VND 151
                                                                                                                                                                                                                                                            AILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGV 95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Application US/08416870C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             E: BIRCH, STEWART, KOLASCH AND BIRCH, LLP
PO BOX 747
                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HIYOSHI,
                                                                                                                                                                                                                                                                                                11.8%; Score 270; DB 2; Length 483; 27.6%; Pred. No. 5.6e-18; tive 53; Mismatches 175; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           US/08/416,870C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        760-195P(PCI)
                                                                                                                                       GGHDKPKI-VDSIQDRGINQVYIIGGDGTQK 194
                                                                                                                                                                                                                                                                                                    68;
                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     420
```

```
Ş
                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              문
Ś
                                                                         S
                                                                                                                 밁
                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RESULT 3
US-08-416-870C-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          쁑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                              US-08-416-870C-6
                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                     Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 6,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patent No.
                                                                                                                                                                                                                                                                                                           INFORMATION FOR SEQ ID NO: (SEQUENCE CHARACTERISTICS: LENGTH: 469 amino acids TYPE: amino acid TYPE: amino acid TYPE: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ZIF: 22040-0747
COMPUTER READABLE FORM:
WEDTUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/416,870C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: MURPHY JR, GERALD M
REGISTRATION NUMBER: 28,977
REFERENCE/DOCKET NUMBER: 760
                                                                                                                                                                                                                                                                                            MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
ADDRESSEE: BIRCH, STEWART, KOLASCH AND BIRCH, LLP STREET: PO BOX 747
CITY: FALL CHURCH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE OF INVENTION: DNA ENCODING ATP-DEPENDENT FRUCTOSE 6-PHOSPHATE
TITLE OF INVENTION: 1-PHOSPHOTRANSFERASE ORIGINATING FROM PLANT, RECOMBINANT VECTY
TITLE OF INVENTION: SAME AND METHOD FOR CHANGING SUGAR CONTENT IN PLANT CELLS UND
                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                     TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  296
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              384 SGVIGHDED -- NGNVLRAIEFPRIKGGKPFNIDTD -- WFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              255 NGIGVVKLMGRYSGFIA----
                                                                                                                                                          37
                                                                                                                                                                                                  109;
AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPR 216
                                                                           ORFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPOKVAADQLVKDGVDILHTIGGDDTNTA 156
                                                                                                                      İVTCĞĞLCPGLNTVİRBIVCGLNDMYGVSRVLGIQGGYRGFYACNTIDLSP---KSVNDN 130
                                                                                                                                                       ILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLIGDSYPVTAEVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Application US/08416870C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGYTGFTSGLVNGR-QTYIPFNRITEKQNNVVITDRMWAR-LLSSTNOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PGKWFGEQ----FAQMIGAEKTIVQ-KSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EGGLLEYVEKRIKODGHWV----IVVAEGAGQELLAAENIK--TSTAKDASGNKLIHDV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EA-----KRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -GLWISDKIKAHFAKIPPMPITLKYIDPTYMIRAVPSNASDN----VYCTLLAQSCVHGVM 404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            USA
                                                                                                                                                                                                                                                                                                                                                                                                                     (703)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KASAOKA, KEISUKE
TYSON, ROBERT HUW
PAGB, ANTHONY MILES JOHN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MINE, TOSHIKI
                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HIYOSHI, TORU
                                                                                                                                                                                                                                                                                                                                                                                                                                        (703)
                                                                                                                                                                                                                                                                                                                                                                                                                  205-8050
                                                                                                                                                                                             11.6%; Score 264.5; DB 2; 26.8%; Pred. No. 1.9e-17; ative 56; Mismatches 173;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                23
                                                                                                                                                                                                                                                                                                                                                                                                  <u>ښ</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                760-195P(PCT)
                                          -GGHDTMKI-VDSIQDRGINQVYVIGGDGTQRG 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----MYATLASROVDLCLIPESPFYLEG
                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          451
                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              383
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    348
                                                                                                                                                              96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                295
```

```
昂
                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-08-416-870C-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         몽
                                                                                                                                                                         US-08-416-870C-2
                                                                                                                                                                                                                                                                                              APPLICATION:

FILING DATE:
CLASSIFICATION: 435
CLASSIFICATION:
ATTORNEY/AGENT INFORMATION:
NAME: MURPHY JR, GERALD M
REGISTRATION NUMBER: 28,977
REFERENCE/DOCKET NUMBER: 760-195P(PCT)
REFERENCE/DOCKET NUMBER: 760-195P(PCT)
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION INFORMATION:
TELECOMMUNICATION 1000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 2, Application US/08416870C Patent No. 5824862
                                                                                                                            Query Match
                                                                                                                                                                                                                                                 TELEFAX: (703) 205-805
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 485 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: D
TITLE OF INVENTION: 1
TITLE OF INVENTION: S
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZIP: 22040-0747

ZIP: 22040-0747

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
                                                                                                                                                                                           MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE: BIRCH,
STREET: PO BOX 74
CITY: FALL CHURCH
                                                                                                                                                                                                             TYPE: amino acid
TOPOLOGY: linear
                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 385 G-VIGHDEDNGNVLRAIEFPRI--KGGKPFNIDTDWFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  275 GGLFRYLEKRLKENGHMV----IVVAEGAGQKLINETKESMG-----KDASGNSILLDV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   234 GIGLVKLMGRHSGFIA-----HYATLASR-------DVDCCLIPESPFYLEGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              217 MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       174 AGVIFBBIRRRGLKVAVAGIPKTIDNDIPVIDRSFGFDTAVEBAQRAINAAHVBAGSAEN 233
                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 T: TYSON, ROBERT HUM
T: PAGE, ANTHONY MILES JOHN
INVENTION: DNA ENCODING ATP-DEPENDENT FRUCTOSE 6-PHOSPHATE
INVENTION: 1-PHOSPHOTRANSFERASE ORIGINATING FROM PLANT, RECOMBINANT VECTO
INVENTION: SAME AND METHOD FOR CHANGING SUGAR CONTENT IN PLANT CELLS UNDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GFTVG--QVNGRHC-YIPFYRITEKQNKVSITDRMWAR-LLSSTNQP 426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PGKWFGEQFAQMIGAEKTIVQ----KSGYFARASASNVDDMRLIKSCADLAVECAFRRES 384
                                        YHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIE 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -GLWLSQKIKEHFKKIKTTINLKYIDPTYMIRAIPSNASDNVYCTLLAHRVVHGAMAGYT
                                                                                                                                                                                                                                                      485 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    E: BIRCH, STEWART, KOLASCH AND BIRCH, LLP
PO BOX 747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MINE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KASAOKA, KEISUKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HISOXIH,
                                                                                                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGH-IKLDAVN 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOSHIKI
                                                                                 11.5%; Score 262; DB 2; 25.7%; Pred. No. 3.4e-17; tive 56; Mismatches 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   23
    IVICGGLCPGLNTVIREIVHSLDYMYGVNK 125
                                                                                                                       Length 485;
                                                                                   Indels
                                                                                 92;
                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              276
                                                                                     17;
```

```
US-08-416-870C-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
US-08-416-870C-10
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 10, Applicat
Patent No. 5824862
GENERAL INFORMATION:
                                                            INFORMATION FOR SEQ ID NO: 1
SEQUENCE CHARACTERISTICS:
LENGTH: 426 amino and a
                                                                                                                                                                                                                                                                                                                  COUNTRY: USA
ZIP: 22040-0747
COMPUTER READABLE FORM:
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PAtentin Release #1.0, Version:
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF ENDUENCES: 23
CORRESPONDENCE BIRCH, STEWART, KOLASCH AND BIRCH, LLP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: MINE, TOSHKI
APPLICANT: KASAOKA, KEISUKE
APPLICANT: TYSON, ROBERT HUW
APPLICANT: TYSON, ROBERT HUW
APPLICANT: PAGE, ANTHONY MILES JOHN
TITLE OF INVENTION: DNA ENCODING ATP-DEPENDENT FRUCTOSE 6-PHOSPHATE
TITLE OF INVENTION: 1-PHOSPHOTRANSPERASE ORIGINATING FROM PLANT, RECOMBINANT VECTO
TITLE OF INVENTION: SAME AND METHOD FOR CHANGING SUGAR CONTENT IN PLANT CELLS UNDE
                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
NAME: MURPHY JR, GERALD W
REGISTRATION NUMBER: 28,977
REFERENCE/DOCKET NUMBER: 76
TELECOMMUNICATION INFORMATION:
                  MOLECULE TYPE:
                                                  TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STREET: PO
CITY: FALL
                                                                                                                                                                                                                                                             APPLICATION NUMBER: FILING DATE: CLASSIFICATION: 435
                                    TOPOLOGY:
                                                                                                                                                TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     353
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             127
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    126 VFGIDGGYRGFYSKNIINLTP---KTVNDIHKRGGTILGSSR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      67
                                                  amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MVVITORMWAR-LESSTNOP 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FNIDTD--WFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QELLABENAHAKNEQ----DASGNKLLQDV--GLWISQKIRDHF-ATKTKMPITLKYIDPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EDPOKVAADQLVKDGVDILHTIGGDDINTAAADLAAFLARNNYGLTVIGLPKTVDNDVFP 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              YMIRAVPSNASDN----VYCTLLAQSCVHGAMAGYTGFTSGLVNGR-QTYIPFNRITEKQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   YFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED--NGNVLRAIEFPRIKGGKP 410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VEAIVAE-MOAKGOEVPRDAFGHIKLDAVNPGKWFGEOFAOMIGAEKTLVO-----KSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EWI.PEIGITRESYEVHAVFVPEWAIDLEAEA-----KRIREVMDKVDCVNIFVSEGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IKQSLGAWTAABQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRA 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HDTTKI-VDSIQDREINQVYIIGGDGTQKGAAVIYEBIRRRGLKVIVAGIPKTIDNDIPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDKSFGFDTAVEEAQRAINAAHVEAESAENGIGVVKLMGRYSGFIA-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      II CYRGGYKGLLLGDSYPVTAEVRKKAGVLORFGGSVIGNSRVKLINVKDCVKRGLVKEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ٧A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Application US/08416870C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IHSOAIH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -MYATLASRDVDLCLIPESPFYLEGDGGLFEYIEKRLKENGHMV----IVIAEGAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHURCH
                                                                                                                                                (703)
                protein
                                                                                                                                                  205-8000
                                                                                                                                                                                                                                                                                                    US/08/416,870C
                                                                                                             10:
                                                                                                                                                                                        760-195P(PCT)
                                                                                                                                                                                                                                                                                                                                           #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           376
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         126
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              352
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                271
```

258

207

```
NUMBER OF SEQ ID NOS: 5674

SEQ ID NO 3774

LENGTH: 345

TYPE: PRT

ORGANISM: Staphylococcus epidermidis
5-09-134-001C-3774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Lynn Doucette-Stamm et al TITLE OF INVENTION: NUCLEIC ACID AND AMINO ACID SEQUENCES RELATING TO STAPHYLOCOCCUS TITLE OF INVENTION: EPIDERMIDIS FOR DIAGNOSTICS AND THERAPEUTICS FILE REFERENCE: GTC-007
CURRENT APPLICATION NUMBER: US/09/134,001C
CURRENT FILING DATE: 1998-08-13
PRIOR APPLICATION NUMBER: US 60/064,964
PRIOR FILING DATE: 1997-11-08
PRIOR APPLICATION NUMBER: US 60/055,779
PRIOR APPLICATION NUMBER: US 60/055,779
PRIOR PILING DATE: 1997-08-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                107; Conservative
                                                                                                                                     146 HTIGGDDTNTAAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFM 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          356 MAGYNGFTVGLVNGRHTYIPFYRITEKQNKVVITDRMWAR-LLSSTNQPSFMKHDDHH 412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     387 I-GHDEDNGNVLRA----IEFPRI--KGGKPFNIDTDWFNSMLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   217 MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE 276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  107 HKRGGTILGTSR--------GGHDTTKI-VDSIQDRGINQVYIIGGDGSQKG 149
                                                                      121 VVIGGDGSYRGAQRISEECKE----IQTIGIPGTIDNDINGTDFTIGFDTA------L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        251 GGLFEFIGKRIKÈIGHMV----IVIAEGAG-QDLLAESNEQSTTL-KDASGNKLIQDV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             დ
დ
                                                                                                                                                                                                                                                                                                                                                    21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          h 11.4%; Score 260; DB 2; Length 426; Similarity 25.6%; Pred. No. 4.4e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
   NVVAEN---
                                                                                                                                                                                                                                                                             TAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDIL 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GLWISQRIKDHFAKKMTLNLKYIDPTYMIRAVPSNASD----NVCCTLLAQSAVH---GV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAVIFEEIRRRGLKVAVAGIPKTIDNDIPIIDRSFGPDTAVEBAQRAINAAHVEATSFEN 209
                                                                                                                                                                                                       --ELGSVGDTIQR-GGTFLFSAR------CPQ---FKE-EDVRKKAIENLRKRGIEGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QRFGGSVIGNSRVKLTNVKDCVKRGLVKBGEDPQKVAADQLVKDGVDILHTIGGDDTNTA 156
                                                                                                                                                                                                                                                                                                                                                    YVVM---KKIAVLTSGGDSPGMNAAVRAVTR--TAIYNNIEVYGVYQGYQGLLDDDIHKL
                                                                                                                                                                                                                                                                                                                                                                                            YTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLIGDSYPV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GKWFGEQFAQMIGAEKTLVQK---SGYFARASASNVDDMRLIKSCADLAVECAFRRESGV 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----AKRLREVMDKVDCVNIFVSBGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNP 329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYFMNVVAENNANPR 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL 96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IVTCGGLCFGLNTVIREIVCGLSYMYGVKKILGIEGGYRGFYARNTIDLDL---KTVNDI 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Application US/09134001C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9.9%; Score 226.5; DB 4
25.4%; Pred. No. 6.3e-14;
tive 68; Mismatches 136
-NANPRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65; Mismatches 174; Indels 72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DB 4; Length 345;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         136; Indels 105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                    75
                                                                      168
                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   355
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            302
                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               망
                                                                                                                                                                                                                                                US-09-107-532A-6470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       US-09-107-532A-6470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 7
                                                                                                       Query Match
Best Local Similarity
Matches 94; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 6470, Application US/09107532A
Patent No. 6583275
GENERAL INFORMATION:
APPLICANT: Lynn A Doucette-Stamm
TITLE OF INVENTION: NUCLEIC ACID
ENTEROCOCCUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO: 6470: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: US/09/107,532A

APPLICATION NUMBER: 05/09/107,532A

FILING DATE: 30-Jun-1998

PRIOR APPLICATION NUMBER: 60/085,598

APPLICATION NUMBER: 60/085,598

APPLICATION NUMBER: 60/051571

FILING DATE: July 2, 1997

ATTORNEY/AGENT INFORMATION:

NAME: Ariniello, Pamela Deneke

REGISTRATION NUMBER: 40,489

REPERENCE/DOCKET NUMBER: GTC-012

TELECOMMUNICATION:
TELECHONE: (781)893-5007

TELECAN: (781)893-8277
                                                                                                                                                                                                                                                                          NAME/KEY: misc feature
LOCATION: (B) LOCATION 1...323
SEQUENCE DESCRIPTION: SEQ ID NO: 6470:
                                                                                                                                                                                                                                                                                                                                                                                                                                                    MOLECULE TYPE: protein HYPOTHETICAL: YES ORIGINAL SOURCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SOFTWARE: ASCII
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                         FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZIP: 02354
COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES: 7310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  378 CAFRRES----GVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGQ 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        318 AFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     258 SYEVHAVEVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRD 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               169 NTIIESVDKIRDTASSHARTFIV-EVMGRDCG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                299 LLKQGETAKGVGI-----RNNQLTSTPFDEI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         259 LTKYINID-----
33 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK 92 |:: | | | : | | : | : : : : : : | | : | | : | | : | : : : : : | | : | | : | | : | | : | : | : : : : : | | : | | : | | : | : : : : : | | : | | : | | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : : : : : | : | : | : | : | : : : : : | : | : | : | : : : : | : | : | : | : : : : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : : : : | : | : | : | : | : | : : : : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : : : : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | : | :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SVGAETIVLPEVNTDIKDVAEKIEQGIKRGKKHSI-----VMVAEGCMSGQECADE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: PC
OPERATING SYSTEM: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                          ORGANISM: Enterococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH: 323 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STATE: Massachusetts
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CITY: Waltham
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STREET:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDIUM TYPE: CD/ROM ISO9660
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADDRESSEE:
                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       100 Beaver Street
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENOME THERAPEUTICS CORPORATION
                                                                                                       9.4%; Score 215.5; DB 4; 24.4%; Pred. No. 6.9e-13; cive 56; Mismatches 114;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 US/09/107,532A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----TRVSVLGHIQRGGSPSGADRVLASRLGGYAVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and David Bush
AND AMINO ACID SEQUENCES RELATING TO
FAECIUM FOR DIAGNOSTICS AND THERAPEUTICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    - FAESDRKFNSOMYELAK 341
                                                                                                              Indels
                                                                                                                                                                          Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -DLALW---AGL---
                                                                                                              121;
```

ð 문 Ś 뫉 Ś В Ś 밁 δ 맑 ş 맑

Ś 밁 Ś 맑 Ś ß. Ś

Gaps

```
US-08-416-870C-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 8
US-08-416-870C-8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                뭐
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  묽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ď.
  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 8, Application US/08416870C Patent No. 5824862
                                                                                                                                                      TELEPHONE: (703) 205-801
TELEFAX: (703) 205-8050
INFORMATION FOR SEQ ID NO: 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
                                                            TOPOLOGY: 1
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                SEQUENCE CHARACTERISTICS:
LENGTH: 522 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                REGISTRATION NUMBER: 28,977
REFERENCE/DOCKET NUMBER: 76
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                      FILING DATE:
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: MURPHY JR, GERALD M
                                                                                                                                                                                                                                                                                                                                                                          SOFTWARE: PatentIn Release #1.0, Version #1.30 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TITLE OF INVENTION: DNA ENCODING ATP-DEPENDENT FRUCTOSE 6-PHOSPHATE
TITLE OF INVENTION: 1-PHOSPHOTRANSFERASE ORIGINATING FROM PLANT, RECOMBI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSBE: BIRCH, STEWART, KOLASCH AND BIRCH, LLP
STREET: PO BOX 747
CITY: FALL CHURCH
                                                                                                 TYPE:
                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COUNTRY: USA
ZIP: 22040-0747
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   269 KFGAYAVELLQEGKGGLCVGIHDNE 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       310
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         140 DGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAARQ 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              252 LGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMD--KVDCVNIFVSEGAGVEAIVAEMQA 309
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           200 GARYFYMVVAEN------NANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPE 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              38 YGINYGFAGLVAGDIRRLDVADVGDKIQRGGTFLYSARYPEFATEEG---QLKGIEQLKK 94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ທ
                                                                                               amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ٧A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SCADLAVECAFRRESGV-IG-HDED 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIK 369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AGGADE-----IIIPEHDFDMASVAKKIQEGRDRGKKHCL-IILAEG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----INTVLESIDRIRDTATSHVRTFVI-EVMGRNAG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FGIEGLVVIGGDGSYHGA-----MALTKRGFPAVGIPGTIDNDIPGTDFTIGFDTA--- 145
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AGVLQRFGGSVIGN-SRVKLTNVKDCVKRG-----LVKEGEDPQKVAADQLVK 139
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KRIGILTSGGDAPGMNAAVRAVVR------KGIYEGL------EV 37
                                                                                                                  522 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MINE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KASAOKA, KEISUKE
TYSON, ROBERT HUW
PAGE, ANTHONY MILBS JOHN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HIYOSHI, TORU
                                                          protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TOSHIKI
                                                                                                                                                                                           205-8000
  9.3%;
                                                                                                                                                                                                                                                                                                                                                       US/08/416,870C
                                                                                                                                                          œ
..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VMGGNEFAEKLSE-FGDYHTRVSILGHVVRGGAPSARDRVWAS 268
                                                                                                                                                                                                                                     760-195P (PCT)
  Score
  211.5;
  멂
  ÿ
Length 522;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ----DIALWSGV 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RECOMBINANT VECT
N PLANT CELLS UND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           226
```

```
US-08-280-690-2
(Sequence 2, Application US/08280690
Parent No. 5583011
US-08-280-690-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멼
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 2, Application Patent No. 5583011 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity
                                                                             TELEFAX: 415-857-0663
TELEX: 380816 CooleyPA
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                   CLASSIPICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Neeley, Richard L
REGISTRATION NUMBER: 30,092
REFERENCE/DOCKET NUMBER: STAN
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IEM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/280,690
                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: 5...
STREET: 5...
CITY: Palo Alto
CTATE: California
                MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                 TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                   TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY: USA
ZIP: 94306-2155
                                                                LENGTH:
                                                                                                                                                                                                                                                                            FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   467
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    375
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     414
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      324 LDAVNPGKWFGEQFACMI------GAEKTLVQKSGYFARASASNVDDMRLIKSCADL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            208 VAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        166 KAAIVTCGGLCPGLNDVIRQIV--FTLETYGVKNIVGIPFGYRGFFEKGL---KEMPLSR 220
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIIC----YRGGY-KGLLLGDSYPVTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EVSFTLDGEHGVLRHLEHLINTKGFCV-VCVAEGAGQDLL-----QKSNATDASGNVI 413
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IGGDDTNTAAADLAAFLARNNYGETVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFMNV 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DVVEN---INLSGGSFLG------VSRGGAKTSB----IVDSIQARRIDMLFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHT 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AVHGAFAGFSGITSGVCNTHYVYLPIT-EVITTPKHVNPNSRMWHRCLTSTGQP 519
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMAIDLEAEAKRLREVMDKVD----CVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIK 323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IGGNGSHAGANAIHEECRKRKIKVSVVAVPKTIDNDILFMDKTFGFDTAVEKAQRAINSA 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     E: Cooley Godward
5 Palo Alto
                                                                  781 amino acids
                                                                                                                                      : 415-843-5070
415-857-0663
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mansour, Tag E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
              protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FGVHMQQKIKKHFKDIGVPADLKYIDPT-YMVRACRANASDAILCTVLGQN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Diagnostics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Compositions, 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       23.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        69;
                                                                                                                                                                                         STAN-141/00US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pred. No. 3.6e
9; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Treatments, and 
or Schistosomiasis and Related Diseases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3.6e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        168;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       466
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     260
```

```
Ş
                               Дb
                                                                S
                                                                                                     B
                                                                                                                                 Ś
                                                                                                                                                                        밁
                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 10
US-09-198-452A-225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ď,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δÃ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                   US-09-198-452A-225
                                                                                                                                                                                                                                                                                                                        TITLE OF INVENTION: Chlamydia pneumoniae genomic sequence and polypeptides, fragments TITLE OF INVENTION: thereof and uses thereof, in particular for the diagnosis, preve TITLE OF INVENTION: and treatment of infection FILE REFERENCE: 9710-003-99

CURRENT FILING DATE: 1998-11-24

NUMBER OF SEQ ID NOS: 6849

LENGTH: 550

TYPE: PRT

CREANISM: Chlamydia pneumoniae

CREANISM: Chlamydia pneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 225, Application US/09198452A
Patent No. 6559294
GENERAL INFORMATION:
APPLICANT: Griffais, R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local
                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     408
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         358
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                254
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151
   185
                                                                                                       104 SLVGFVNNGDGLTNNKSIDITBEFLSK---FRNSGGFNCIGTGRKKI------VTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     194 WTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLiDRAEWLPELG 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                35 VAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAG
                                                                                                                                        66 EIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGG-SVIGNSRVKLTNVKDCVKRGLVK 124
                                                                                                                                                                                                                                              81;
                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IVKNLIVSELQL---DTRITVLGHVQRGG-SPSA-FDRILGSRMGAEAVL------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LTRESYEVHAVFVPEMAIDLEABAK---RLREVMDKVDCVN-IFVSEGAGVEA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DDTNTAA----ADLAAFL------ARNNYGLTVIGLPKTVDNDVFPIKQSLGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VLQRFGGSVIGNSRVKLTNVKDCV----KRGLVKEGEDPQKVAADQLVKDGVDILHTIGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GKPFNID-----TDWFNSM----LSEIGQPK 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ALMDADRDPNLPSC-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SASNVDDMRLIKSCADLAVECAPRRESGVIGHDEDNGNVLRAIEFPRIK------G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SALHRIIBATDAISTTAHSHQRCFIL-EVMGRHCGYLALVAS-----MACEADW-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ILQ-LGGTKIGSAR-----CMDFRERYGRLK-----AAENLVKNQITNLVVIGG
                                     EAKEACLKTAEALDEDGLVI---IGGDGSNTATAILAEYFAKRRPKTSIVGVPKTIDGDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MKACDFDHAVELRGTSFMNNLATYIKLSKIEQPR 399
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----ivaemoakgoevprdafghikldavnpgkwfgbopaomigaektivoksgyfara
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DGSLTGANLFRAEWSSLLEELVTSNKISAESAKOFHRLNIVGLVGSIDNDFCGTDMTIGA
   FP--IKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVH----SVWGRNCGWLTAATA-Q
                                                                    EGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDV 184
                                                                                                                                                                                                         YHLTADIRECHWEELNE-NEYTLMNKEKKVAILTAGGLAPCLNSAIGSLIERYTEIDESI 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --VPIPEMPPTDDWREKLCHKLRMNREHGQRVNIIMVAEGAIDRACKPITCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  9.0%;
                                                                                                                                                                          ---YLKFVQGENVVHTPLKVGVMFSGGPAPGGHNVIQGLFNSLKDFHPDS
                                                                                                                                                                                                                                                           7.9%;
                                                                                                                                                                                                                                              65;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; Score 206.5; DB 1; pred. No. 2.1e-11; 71; Mismatches 139;
                                                                                                                                                                                                                                                             Score 181; DB 4;
Pred. No. 3.9e-09;
                                                                                                                                                                                                                                              Mismatches 135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---VISLD---GN--QAVRVPLVKCVDRTRQVAEA
                                                                                                                                                                                                                                                                              Length 550;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 781;
                                                                                                                                                                                                                                              Indels 88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels 133;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                            103
                                     207
                                                                                                         150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              357
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               77
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        180
                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                        6
                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 11
US-09-198-452A-180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             岁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         γ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                윩
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  В
                                                       믕
                                                                                      S
                                                                                                                          片
                                                                                                                                                                                            片
                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                 片
                                                                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                     8
                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
       RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-198-452A-180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 180, Application US/09198452A
Patent No. 6559294
GENERRAL INFORMATION:
APPLICANT: Griffais, R.
TITLE OF INVENTION: Chlamydia pneumoniae genomic sequence and polypeptides, fragment;
TITLE OF INVENTION: thereof and uses thereof, in particular for the diagnosis, previous REFERENCE: 9710-003-999
CURRENT APPLICATION UNMERR: US/09/198,452A
CURRENT FILING DATE: 1998-11-24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQ ID NOS: 6849
SEQ ID NO 180
LENGTH: 544
TYPE: PRT
ORGANISM: Chlamydia pneum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
     12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                          165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               322
                                                                                                                           383
                                                                                                                                                           334
                                                                                                                                                                                              329
                                                                                                                                                                                                                                                                   278
                                                                                                                                                                                                                                                                                                    236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          369
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    208
                                                                                                                                                                                                                               290 VNIFVSEGAGVEAIVAEMQAKGQEV-----
                                                                                                                                                                                                                                                                                                                                                                       190 SIGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGR-----NCGWLTAAT-----
                                                                                                                                                                                                                                                                                                                                                                                                                                         132 VAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVPP--IKQ 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              131 IYDYY-----NMGGFDMLSSSREKIKTEEQKKNILNTVK------
                                                         429 ALGIIS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               71 SKPLKIGVILSGGQAPGGHNVVIGLFDALRVFNPKTRLFGFIKGPLGLTRGLYKDLDISV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              79 LGDSYPVTAEVRKKAGVLQRFGG-SVIGNSRVKL-----TNVKDCVKRGLVKEGEDPQK 131
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                30 NKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICY-------RGGYKGL---L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EYRKLIDRAEWLPELGITRESYEVHAV--------FVPEMAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QHTFLDLAFGFDTA----TKFYSSIISNISRDALSCKAHYHFIKLMGRSASHIALECALQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YVSKISVDK 377
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LITEIBSLSBYEDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LEASAKRIRSVMDKVDCVNIFVSSGAGVSAIVASMQAKGQSVP---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  THPNIALIGREIAEKNIPLKTI-IHKICSVIADRAAMEKYYGVILIPEGIIEFIPEI-IN
                                                                                                                                                           GEOFAQMIGAEKTLVQKS------GYFARAS-ASNVDDMRLIKSCADLAVECAFRR
                                                                                                                                                                                                                                                                 IATRKISLKQLSEQL-ALGIVRRYKSGKNYS--TVLIPEGLIEHIFDTRKL-----IDE
                                                                                                                                                                                                                                                                                                                                       SIGFHTSCRTYSEMIGNLAKDALSAKKYHHFIRLMGQQASYTTLBCGLQTLPNIALISEL
                                                                                                                                                                                                                                                                                                                                                                                                          ----QLKLDGLLI----IGGNNSNIDTAMLAEYFLAHNCKISVIGVPKTIDGDLKNCWIET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLDAVNPGK 331
                                                                                        ESGVIGHDEDNGNVLRAIEFPRIKGGKPFNID-----TDW
                                                                                                                             EBLLAVMVKKEIBKIKPHMEFHSVSHFFGYBARAGFPSNFD----
                                                                                                                                                                                                LNVLLANGD-
                                                                                                                                                                                                                                                                                                  -AQEYRKLLDRAEWLPELGLTR----ESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        pneumoniae
                                                                                                                                                                                            -SSMKNSFQALSRDIKTFHLFPKDIANQLLLARDSHGNVRVSKIAT----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   7.5%; Score 171.5; DB 4; 22.1%; Pred. No. 3.3e-08; ative 70; Mismatches 144;
                                                       ---ALFLVROKTGYMITINNLAQSYTEW 459
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -ISRLSPESQRILKSFPAPIIEQILNDRDAHGNV
                                                                                                                                                                                                                                 ----PRDAFGHIKLDAVNPGKWF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Indels 145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
                                                                                            417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -----RDAFGHI 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                               CNYGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   321
                                                                                                                                                                                                                                                                                                                                                                                                            217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        263
                                                                                                                               428
                                                                                                                                                                                                  382
                                                                                                                                                                                                                                                                                                                                         277
                                                                                                                                                                                                                                                                                                                                                                            235
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   368
```

```
RESULT 13
US-09-541-782-4
                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                        ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-198-452A-458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-198-452A-458
              Sequence 4, Application US/09541782
Patent No. 6284480
GENERAL INFORMATION:
APPLICANT: Nislow, Corey
APPLICANT: Sakowicz, Roman
APPLICANT: Beraud, Christophe
TITLE OF INVENTION: Antifungal Assay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 458, Application US/09198452A
Patent No. 6559294
GENERAL INFORMATION:
APPLICANT: Griffais, R.
TITLE OF INVENTION: Chlamydia pneumoniae genomic sequence and polypeptides, frac
TITLE OF INVENTION: thereof and uses thereof, in particular for the diagnosis,
TITLE OF INVENTION; and treatment of infection
FILE REFERENCE: 9710-003-999
FILE REFERENCE: 9710-003-999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CURRENT APPLICATION NUMBER: US/09/198,452A
CURRENT FILING DATE: 1998-11-24
NUMBER OF SEQ ID NOS: 6849
SEQ ID NO 458
LENGTH: 845
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
FILE REFERENCE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: PRT ORGANISM: Chlamydia pneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local Similarity
                                                                                                                                                                                                                                                                671
                                                                                                                                                                                                                                                                                                                                                                                                                                            574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          199
                                                                                                                                                                                                                                                                                                                                                     617 YVGH-EEGGHLTEQVRRRPYCVVLFDEIEKAHP---
                                                                                                                                                                                                                                                                                                                                                                                             386 VIGHDEDNGNVLRAIE-----FPRIKGGKPFNIDTDWFNSMLSEIGQPK-----GGK 432
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 522 KLLKLEDTLRRKV-----IGQNDAVTSİCRAIRRSRTGIKDPNRFTGSF--LFLGPTGV 573
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           404 QYVHGRFLPDKAIDLLDBAGARVRVNTMGQ--PTDLMKLBABIENTKLAKEQAIGTQBYB 461
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    344 YRKHIEKDAALERRFQKIVVHPPSVDETIBILRGLKKKYBEHHNVFITEBALKAAATLSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              234 AGVGKTAIVEGLAQ------KIILNEVPDALRKKRLITLDLALMIAGTKYRGQFEE 283
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     179 DKNEKLSALKAYGYDLTEMVRESKLDPVÍGRSSEVERLÍLÍLCRŘRKNNPVLÍGE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             30 NKPKKVAILTAGG---LAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVT 86
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RIREVMD----KVDCVNIFVSEGAGVEAIVAEMQ-----AKGQEVPRDAFGHIKLDAVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KVAA--DQLVKDG-----VDILHTIGGDDINTAAAD----LAAFLARNN---YGLIVI-- 174
                                                                                                                                                                                                                                                              VDFRH 675
                                                                                                                                                                                                                                                                                                        VEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GK-WFGEQFA-QMIGAEKTLVQ--KSGYFARASASNVDDMRLIKSCADLAVECAFRRESG 385
                                                                                                                                                                                                                                                                                                                                                                                                                                        GKSLLAQQIAIEMFGGEDALIQVDMSEYMEKFAATKM----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KAAGLRDBEKKLRERLQSMKQEWENHKEEHQVPVDEEAVAQVVSLQTGIPSARLTEAESE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                K---LIDRAEWLPE-LGLTRESY----EVHAVFVPEMAID-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RIKAVMDEVRKHGNILLFIDELHTIVGAGAAEGAIDASNILKPALARGEIQCIGATTIDE 343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AEVRKKA---GVLORFGGSVIGNSRVKLINVKDCVKR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
1015
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5.0%; Score il3.5; DB
21.5%; Pred. No. 0.033;
tive 73; Mismatches I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             --GLPKTVD--NDVFPIKQSL-GAWTAAE 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             170;
                                                                                                                                                                                                                                                                                                                                                   -DIMDIMIQILEQGRITDSFGRK 670
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels 185;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 845;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ------LEAEAK 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -GLVKEGEDPQ 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                          616
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           fragments
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             preve
```

```
밁
                                        Ś
                                                                                             용
                                                                                                                                 S
                                                                                                                                                                                      밁
                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                 멹
                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ; ORGANISM: Saccharomyces cerevisiae US-09-541-782-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT APPLICATION NUMBER: US/09/541,782
CURRENT FILING DATE: 2000-04-03
NUMBER OF SEQ ID NOS: 10
SOPTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 4
LENGTH: 1038
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 4.4%; Score 99.5; DB 3; Length 1038; Best Local Similarity 20.7%; Pred. No. 1.1; Matches 85; Conservative 65; Mismatches 160; Indels 101
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                        332 WFGEQFAQMIGAEKTL---VQKSGYFARASASNVDDM-----RLIKSCADLAVECAFRRE 383
                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                    828
                                                                                                                                                                                                                                                                                                                                 218
                                                                                                                                                                                                                                                                                                                                                                                 778
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             107 SRVKLTNVKDCVKR------GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAA 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          685 LNTMQQESILQETNIQPNLDMI-------KNEVLTLMRTMQEKAELM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     47 LNSAIGSLIERYTEIDESIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGN
NAT--KDEMIENILK--BIPNLSKKMPLRLSNINSNSVQSVI-SPKKHAIE 1017
                                                                                                                                                                                      LS-----QIKSTYDTSSNSMNESISV-----MKGQVEESENAISLLK----NNTK
                                                                                                                                                                                                                                    LEAEAKRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQ-EVPRDAFGHIKLDAVNPGK 331
                                                                                                                                                                                                                                                                                 LIMEN -----LITATSAVIDQEMDLFSEKRVKWENSFDLINDCDSMNNBFYNSMAAT 879
                                                                                                                                                                                                                                                                                                                               LIVHEVMGRNCGWLTAATAQEYRKLLD-----RAEWLPELGLTRESYEVHAVFVPEMAID 272
                                                                                                                                                                                                                                                                                                                                                                                                                            ADIAAFLARNNYGITVIGIPKTVDNDVFPIKQSIGAWTAAEQGARYFMNVVAENNANPRM 217
                                             SGVIGHDEDNGNVLRAIBFPRIKGGKPFNIDTDWFNSMLSEIGQPKGGKVE 434
                                                                                             - FNDQFEQLINKHNMLKDNIKNSITSTHSHITNVDDIYNTIENIMKNYGN-----
                                                                                                                                                                                                                                                                                                                                                                            YLKNHFFKNNHQEL----LINKHVDSTYENIEK-----RTNEFVENFKKVLNDHLDENKK 827
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----YKDCVKKILNESPKFFNVVIEKIDIIRVDFQKFYKNIAENLSDISEENNNMKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                           920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    777
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               724
```

```
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
US-09-723-820-4
```

Query Match
4.4%; Score 99.5; DB 4; Length 1038;
Best Local Similarity 20.7%; Pred. No. 1.1;
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 101; Gaps 18
Matches 85; Conservative 65; Mismatches 160; Indels 160;

8 8

Q	ΔP	Ş	B &	dg VQ	da Qy	dd Vy	g 4	Query M Best Lo Matches	RESULT 15 US-09-328-3 / Sequence / Patent No GENERAL II / APPLICAN TITLS OF / TITLS OF / FILE REF / CURRENT / CURRENT / NUMBER O / SEQ ID NO / LENGTH: / TYPE: P / ORGANIS US-09-328-3	₽ \$	Db Qy	Db Oy	db Qy	B &	당상
271 IDL-EAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQB 313	332 RRFQKVLVDEPSVEDTIAILRGLKEKYATHHGVQILDSAIIAAAKMSHRYITDRQLPDKA 391	AVF	213 ANDRMLIVHEVMGRNCGWLTAATAQBYRKLLDRAEML- 249	173 VIGLPKTVDNDVFPKQSLGAWTAAEQGARY	130 QKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLT 172 :	85 VTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGIVKEGEDP 129	27 TLMNKPKKVAIL-TAGGLAPCLNSAI-GSLIERYTBIDPSIBIICYRGGYKGLLLGDSYP 84 ::	A.2%; Score 96; DB 4; Length 863; Local Similarity 20.9%; Pred. No. 1.8; ses 104; Conservative 69; Mismatches 157; Indels 168; Gaps 26;	UULT 15 109-328-352-6730 109-328-352-6730 109-328-352-6730 109-328-352-6730 209-328-352-6730 209-328-352-6730 209-328-352-6730 209-328-352-6730 209-328-352-6730	384 SGVIGHDENMINIKAAIEFFRIKGSKPFINITUWFFSKEISEIGQFMGKVE 434	1 2	273 LEAEAXRLEEVMDKYDCVNIFYSEGAGVEAIVAEWQAKGQ-EVPRDAFGEIKLDANNPGK 331	218 LIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAID 272	158 ADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANEM 217	SRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDLHTIGGDDTNTAA

D O	Ş	D	Qy	В
492 REGDLABAARLQYGVI 507	373DLAVECAFRRESGVI 387	452 VEKEYNDLEEVW	314 VPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCA- 372	392 IDLIDEAASRIKMEIDSKPEALDKLDRRLIQLKMQLEAVKKDEDAGSKAEVTHLEKQIAE 451
		E C	72	1

Search completed: January 29, 2004, 14:39:01 Job time: 23 secs

```
Result
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OM protein - protein search, using sw model
        Pred. No. is the number of results predicted by chance to score greater than or equal to the score of the result be and is derived by analysis of the total score distribution
     Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         seq length: 0 seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR 76:*
1: pir1:*
2: pir2:*
3: pir3:*
4: pir4:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              January 29, 2004, 14:32:17 ; Search time 21 Sec
(without alignments)
2001.224 Million cel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            283308 segs, 96168682 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 DVVTWPYHLTADIRFCHWFF.....FNSMLSEIGQPKGGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     US-09-941-947A-2
2284
     GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compagen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length DB
  R2836
P37613
P375500
P735500
P735500
P735501
P7365011
T05011
T05011
T05011
T06016
T13433
JC0016
S332902
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHOCFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHECFA
KHOCFA
KHO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of the probable of th
```

ъ СП	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30
204	204.5	207	207.5	209	209	210	210	210.5	210.5	210.5	211.5	213.5	215	216.5	220
8.9	9.0	9.1	9.1	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3	9.3	9	9.5	9.6
463	784	959	791	323	319	789	780	544	343	320	348	321	335	319	780
N	Ŋ	44	Ŋ	μ	Н	_	_	Ŋ	Ņ	N	Ŋ	Ŋ	N	N	-
B84613	JC2055	JQ0017	A53206	G64223	KIBSFF	A45617	KIHUFM	S52081	G87121	F84965	T45407	C70447	F95103	F96963	KIRBF
hypothetical prote	6-phosphofructokin	6-phosphofructokin	6-phosphofructokin	6-phosphofructokin	6-phosphofructokin	6-phosphofructokin	6-phosphofructokin	diphosphate-fructo	6-phosphofructokin	6-phosphofructokir	phosphofructokinas	phosphofructokinas	6-phosphofructokir	6-phosphofructokir	6-phosphofructokin

econds 8) ell updates/sec GKVBV5H 437	36 210.5 9.2 343 2 G87120 37 210.5 9.2 544 2 S52081 38 210 9.2 780 1 KIHUFM 39 210 9.2 789 1 A45617 40 209 9.2 319 1 KIBSFF 41 209 9.2 319 1 KIBSFF 41 207 5.9 1 791 2 A53206 43 207 9.1 959 1 JQ0017 44 204.5 9.0 784 2 JC2055 43 207 9.1 959 1 JQ0017 44 204.5 9.0 784 2 JC2055 45 204 8.9 463 2 B84613 RESULT 1 A41169 diphosphate-fructose-6-phosphate 1-phosphotransferase (EC NyAlternate names 6-phosphate [pyrophosphate]
to have a peing printed,	RESULT 1 A41169 A41169 A41169 A, Alternate fructose-6-phosphate 1-phosphotransferase (BC 2.7.1.90) - Propionibacterium diphosphate-fructose-6-phosphofructokinase (pyrophosphate) C, Species: Propionibacterium freudenreichii C, Species: Propionibacterium freudenreichii C, Pate: 17-unl-1992 #sequence_revision 14-Apr-2003 #text_change 14-Apr-2003 C, Accession: A41169 R, Jadror, U.S.; Gollapudi, L.; Tripathi, R.L.; Latshaw, S.P.; Kemp, R.G. J. Biol. Chem. 266, 16550-16555, 1991 A, Biol. Chem. 266, 16550-16555, 1991 A, Title: Cloning, sequencing, and expression of pyrophosphate-dependent phosphofructokin A, Reference number: A41169; MUID:91358443; PMID:1653240 A, Recession: A41169 A, Accession: A41169 A, Residues: 1-404 < LAD> A, Residues: 1-404 < LAD> A, Residues: 1-404 < LAD> A, Residues: 1-404 < LAD> A, Comment: This is an example of a nonallosteric, pyrophosphate-dependent phosphfructokin C, Keywords: phosphotransferase F, 5-322/Domain: 6-phosphotructokinase 1 homology < 6PF1> Query Match Best Local Similarity 62.6%; Pred. No. 4.2e-86;
cription	Query Match 57.5%; Score 1314; DB 2; Length Best Local Similarity 62.6%; Pred. No. 4.2e-86; Matches 248; Conservative 60; Mismatches 88; Indels
hosphate-fructo pothetical prote -phosphofructok	QY 33 KKVAILTAGGLAPCLNGAIGSLIERYTBIDPSIBIICYRGGYKGLLIGDSYPVTABVRKK
bable diphospha bhable diphospha hable diphospha	Qy 93 AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD
phosphofructokin ophosphate-depe phosphofructokin	Qy 153 TNTAAADLAAFLARNYGLTVIGLFKTVDNDVFFIKQSLGAWTAABQGARYFMVVAENN
bable diphospha	
hosphofructokin bhosphofructokin bhosphofructokin	Qy 213 ANPRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPENAID
hosphofructokin hosphofructokin	QY 273 LEAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEWQAKGQEVPRDAFGHIKLDAVNPCKW
hosphofructokin	Db 247 LDAEAERLETVMDEVGSVNIFISEGAGVPDIVAQMQATGQEVPTDAFGHVQLDKINFGAW
hosphate-fructo hosphofructokin	OY 333 FGEQPAQMIGAEKTLYQKSGYFARASASNYDDWRLIKSCADLAVECAFRRESGVIGHDED
hosphofructokin	ÓFAERÍGAGKTMVQKSGYFSRSAKSNAQI
hosphofructokin	Qy 393 NGNVLRAIBFPRIKGGKPFNIDTDWFNSMLSBIGQF 428

```
C;Accession: AC2836

R;Wood, D.W.; Setubal, J.C.; Kaul, R.; Monks, erage, G.; Gillet, W.; Grant, C.; Guenthner, E; Karp, P.; Romero, P.; Zhang, S. Science 294, 2317-2323, 2001

A;Authors: Yoo, H.; Tao, Y.; Biddle, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.; Jung, P.
R;Goodner, B; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Qurollo, B., Science 294, 2323-2328, 2001
A;Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterium A;Reference number: A97359; MUID:21608551; PMID:11743194
                                                                                                                                                                            ppi-phosphofructokinase (AF246209) [imported] - Agr
C;Species: Agrobacterium tumefaciens
C;Date: 30-Sep-2001 #sequence_revision 30-Sep-2001
C;Accession: F97613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ster, E.W.

A;Title: The Genome of the Natural Genetic Engineer Agrobacterium
A;Reference number: AB2577; MUID:21608550; PMID:11743193
                                                                                                                                                                                                                                                                                                             RESULT
F97613
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Map position: circular C;Superfamily: pyrophosph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Gene: pfp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Residues: 1-479 <KUR>
A;Cross-references: GB:AE008688; PIDN:AAL43105.1;
A;Experimental source: strain C58 (Dupont)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              hypothetical protein pfp [imported] - Agrobacterium tumefaciens (strain C58, C;Species: Agrobacterium tumefaciens C;Species: 11-Jan-2002 #sequence_revision 11-Jan-2002 #text_change 14-Apr-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ;Accession: AC2836
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ٨.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  351
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     111
                                                                                                                                                                                                                                                                                                                                                                                                                                              471
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        411
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             246;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HLTADI----RFCHWFFLNFNFYTLMKPKKVAILTAGGLAPCLNSAIGSLIERYTBIDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZIDIIAYRSGYQGVLLGERIBITKDMREKAHLLHRYGGSPIGNSRVKLTNAADCAKRGLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DRAEWLPELGLTRESYEVHAVFVPEMAIDLEASAKRLRSVMDKVDCVNIFVSSGAGVEAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HIHAAVASICQTCLWVYAK---RRAMMAKQKVAMLTAGGLAPCISSAVGGLIERYSDIAP
                                                                                                                                                                                                                                                                                                                                                                                                                                              HVGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           40013
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DMRLIKSCADLAVECAPRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KEGDNPLRVÄÄBRLAADGITILHTIGGDDTNTTÄADLAAYLGANGYDLTVVGLPKTVDND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DLRLIQGMVDLAVESALNKVSGVTGHDEDQNGKLRTIEFPRIKGGKHFDLSAKWFTEVME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VAERBAAGEAVKRDAFGHVKIDTINVGGWFQXQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RGNDYVEGLMMVTQMKNIDGIYLPEMAFDIEAEAERLKEVMDKHGYVTLFVSEGAGLDAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WVPIKQSLGAWTAAEVGAAFFDNVSNEQSAAPKTFVIHEVMGRHCGWLTAATARAYIQKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   pyrophosphate dependent phosphofructokinase; 6-phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                              475
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Y.; Biddle, P.; Jung, M.; Krespan, W.; Perry, M.; Gordon-Kamm,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        56.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         71;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 1292.5; DB 2;
Pred. No. 1.8e-84;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      D.; Chen, L.; Wood, G.B.; Chen, Y.; D.; Kutyavin, T.; Levy, R.; Li, M.; N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               || :|| || :::| | | || || || ::: :| |
|FAGLIGAERSMVQKSGYFARSAPANGD
                                                                                                                                                                                                                                                                               Agrobacterium tumefaciens (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         101; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PID:g17740576;
                                                                                                                                                                                                           #text_change 14-Apr-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      479;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GSPDB:GN00186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    tumefaciens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            470
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  410
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dupont)
                                                                                                                   Goldman,
kelz, B.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ; Woo,
McClel
                                                                                                                                                                                                                                                                                  C58,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ۳
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          hom
                                                         tun
```

```
A;Accession: F97613
A;Status: preliminary
A;Molecule type: DNA
A;Residues: 1-514 <KUR>
A;Cross-references: GB:Al
C;Genetics:
C;Genetics: A;Gene: AGR C 3836
A;Gene: AGR C 3836
                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                               $
                                                                                                                                                                                                                                                                                                             片
                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                      S
맑
                    á
                                              뮹
                                                                      Ś
                                                                                                    븅
                                                                                                                       5
                                                                                                                                                      뮹
                                                                                                                                                                             Ś
                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                맑
                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 246
                                                                                                                                                                                                                                                                                                             146 EIDIAYRSGYQGYLLGERIEITKDMREKAHLLHRYGGSPIGNSRYKLINAADCAKRGLV
                                                                                                    386
                                                                                                                              304
                                                                                                                                                       326
                                                                                                                                                                                244
                                                                                                                                                                                                                                                            206
                                                                                                                                                                                                                                                                                      124
                       424
                                                   446
                                                                          364
                                                                                                                                                                                                         266
                                                                                                                                                                                                                                  184
                                                                                                                                                                                                                                                                                                                                                                                                                     246;
                                                                                                                                                                                                                                                                                                                                  64 SIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLV
                                                                                                                                                                                                                                                                                                                                                               Similarity
                        EIGOP
                                                                      DMRLIKSCADIAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLS
                                                                                                                                                      RGNDYVEGLAMNTQMKNIDGIYLPEMAFDIBAEAERLKEVMDKHGYVTLFVSEGAGLDAI
                                                                                                                                                                                DRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGVEAI
                                                                                                                                                                                                                                VPPIKOSLGAHTAAEOGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLL
                                                                                                                                                                                                                                                                            KEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFIARNNYGLTVIGLPKTVDND
HVGQP
                                                 DLRLIQGMVDLAVESALNKVSGVTGHDEDQNGKLRTIEFPRIKGGKHFDLSAKWFTEVME
                                                                                                                            VAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVD
                                                                                                                                                                                                          VVPIKQSLGAWTAAEVGAAFFDNVSNBQSAAFKTFVIHEVMGRHCGWLTAATARAYIQKT
                                                                                                                                                                                                                                                            KEGDNPLRVAAERLAADGITILHTIGGDDTNTTAADLAAYLGANGYDLTVVGLPKTVDND
                                                                                                      VAEREAAGBAVKRDAFGHVKIDTINVGGWFQKQFAGLIGAERSMVQKSGYFARSAPANGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        circular
                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                        428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GB:AE007869; PIDN:AAK87863.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                56.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 1292.5;
Pred. No. 2e-
                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 101;
                                                                                                                                                                                                                                                                                                                                                                                                                                   2e-84;
                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PID:g15157249;
                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                               514;
                                                                                                                                                                                                                                                                                                                                                                                                                  7;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GSPDB:GN00169
                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                                                                                                   303
                                                                                                                                                                                                                                                                                                                205
                                                                                                                                                                                                                                                                                                                                         123
                                                                                                                                                                                                                                                                                                                                                                   145
                                                    505
                                                                             423
                                                                                                       445
                                                                                                                              363
                                                                                                                                                         385
                                                                                                                                                                                                          325
                                                                                                                                                                                                                                   243
                                                                                                                                                                                                                                                             265
                                                                                                                                                                                                                                                                                      183
                                                                                                                                                                                                                                                                                                                                                                                            63
```

A;Experimental source: strain A3(2)
R;Alves, A.M.; Euverink, G.J.; Bibb, M.J.; Dijkhuizen, L. Appl. Snviron. Microbiol. 63, 956-961, 1997
A;Title: Identification of ATP-dependent phosphofructokinase A;Reference number: Z22050; MUID:97208211; PMID:9055413
A;Accession: T42063
A;Status: preliminary; translated from GB/EMBL/DDBJ R;Seeger, K.; Harris, D.; James, K.D.; Parkhill, J.; Barrell, submitted to the EMBL Data Library, August 1999
A;Reference number: Z21580 6-phosphofructokinase (EC 2.7.1.11) - Streptomyces coelicolor C;Species: Streptomyces coelicolor C;Date: 05-Nov-1999 #sequence_revision 05-Nov-1999 #text_chan C;Date: 05-Nov-1999 #sequence_revision 05-Nov-1999 #text_chan C;Accession: T35500; T42063 R;Seeger, K.; Harris, D.; James, K.D.; Parkhill, J.; Barrell, A; Molecule type: DNA A; Residues: 1-342 <SEE> A; Reference number: A; Accession: T35500 A; Cross-references: EMBL: AL109661; A;Status: preliminary; translated from PIDN:CAB51967.1; GSPDB:GN00070; GB/EMBL/DDBJ #text_change B.G.; Rajandream, 12-May-2003 SCOEDB:SC6E10.13c

Z

A; Molecule type: DNA A; Residues: 1-342 < ALV > A; Cross-references: EMBL: U51728; NID: C; Genetics: A; Gene: pfkA; SC6E10.13c C; Superfamily: 6-phosphofructokinase, NID:g1931572; PIDN:AAC45135.1;

გ 8

regulatory

step

ä

bacterial type; 6-phosphofructokinase _ homology

PID:g1931573

6

```
Nature 390, 580-586, 1997

A;Authors: Smith, H.O.; Venter, J.C.

A;Title: Genomic sequence of a Lyme disease spirochaete,

A;Reference number: A70100; MUID:98065943; PMID:9403685
    ဌ
                                  8
                                                                               몽
                                                                                                                      8
                                                                                                                                                                         8
                                                                                                                                                                                                            5
                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: GB:AB001172; GB:AE000783; NID:g2688654; PIDN:AAC67070.1; PID:g268865
A;Experimental source: strain B31
C;Superfamily: pyrophosphate dependent phosphofructokinase; 6-phosphofructokinase 1 homo
C;Keywords: phosphotransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C;Accession: F70190
R;Fraser, C.M.; Casjens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C;Date: 10-Sep-1999
C;Accession: F70190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           probable diphosphate-fructose-6-phosphate 1-phosphotransferase (EC 2.7.1.90) C;Species: Borrelia burgdorferi (Lyme disease spirochete) C;Datc: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 14-Apr-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Residues: 1-448 < KLE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Status: preliminary; nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Accession: F70190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           돲
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ₽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C; Keywords: ATP; glycolysis; phosphotransferase
                                                                                                                                                                                                                                                                                    Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                     82-398/Domain:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bowman,
                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        D.; Peterson, J.; Kerlavage, man, C.; Garland, S.; Fujii,
                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         161
                                                                                                                                                                                                                                                                    102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               214 NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       154 NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  105;
                                                                                                                                                                              8
                                                                                                                                                                                                                        34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   59 GILPR-GGTVLGSSRTNPLKQRDGIRR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34 KVAILTAGGLAPCLNSAIGSLIERYTBIDPSIEIICYRGGYKGLLIGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
  QKGSLLIAESI EKRNIKI AVVGI PKTVDNDFMFVQKSFGFETAVEQAVAAVAGAHFEANS
                                         NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA 213
                                                                                                                               GVLORFGGSVIGNSRVKLTNVKDCVKRGLVKBGEDPQKVAADQLVKDGVDILHTIGGDDT 153
                                                                                                                                                                                                                     KVAILTAGGLAPCLNSAIGSLIERYTBIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AVNPGKWFGEQFAQMIGAE-KTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GVI,QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                         KAAITTCGGLCPGPNDVIRSIVRTLWKIYGVRNIYGVKFGYQGLLPESNSPFINLNPDVV 140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GVIGHDEDNGNV--LRAIEFPRI 405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LGVATRLA-----DEYGVPCVGVPKTIDNDLSATDYTFGFDTAVGIATEAIDRLHTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KVGVLTGGGDCPGLNAVIRAVVRKGVQ-EYGYDFTGFRDGWRGPLBGDTVPL--DIPAVR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EQVCSWVTSRFRASYAPI ---- VVVAEGA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EA----EAKRLREVMDKVDCVNIFVSEGAGVEAIVABMQAKGQEVPR----DAFGHIKLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HMRVLVV-EVMGRHAGWIALHS-----
                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                     6-phosphofructokinase 1 homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13.6%; Score 311; DB 2; Length 342; ilarity 27.4%; Pred. No. 1e-14; Conservative 63; Mismatches 137. Trans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -HDGDFGKMVALRGTDIVRV 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GEWLAKQIBKRTGNEARTTV--LGHVQRGGTPSAFDRWLATRFGLHAVDCV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S.; Huang, W.M.; Sutton, G.G.; Clayton, R.; Lathigra, R.; erlavage, A.R.; Quackenbush, J.; Salzberg, S.; Hanson, M.; Fujii, C.; Cotton, M.D.; Horst, K.; Roberts, K.; Hatch,
                                                                                                                                                                                                                                                                                    11.8%;
                                                                                                                                                                                                                                                                  . 69
                                                                                                                                                                                                                                                                                    Score 270; DB 1; Length 448; Pred. No. 1.3e-11;
                                                                                                                                                                                                                                                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ----GLAGGA---NVILIPEQRFDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MPRDGDMVLKDESLDSYGHVRLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   --IKDNLAALGVEALITIGGEDT 105
                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Borrelia burgdorferi
                                                                                                                                                                                                                                                               62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             78;
                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                      183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           325
  243
                                                                                                                                                                                                                     93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ı
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Lyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             3 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               œ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Vugt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            dise
                                                                                                                                                                                                                                                                                                                                                                                           A;Gene: Eh/P
C;Superfamil
C;Keywords:
                                  Ď,
                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          diphosphate-fructose-6-phosphate 1-phosphotransferase (EC 2.7.1. N;Alternate names: 6-phosphofructokinase (pyrophosphate) C;Species: Entamoeba histolytica C;Date: 05-May-2000 #sequence revision 05-May-2000 #text_change C;Accession: §49458; S68243; $52082
δ
                                                                                                                               닭
                                                                                                                                                              Ś
                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                             S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A;Molecule type: DNA
A;Residues: 46-108,'R',110-416,'NELI',435,'NDHYIL' <HUA>
A;Cross-references: EMBL:U12513; NID:9529008; PIDN:AAA92671.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Cross-references: EMBL:X82173; NID:g558573
A;Note: the authors present evidence of the enzymes activity
A;Note: the sequence is revised in GenBank entry EHPPIPFK, release 114, (PIDN:CAA57659
A;Note: the sequence is revised in GenBank entry EHPPIPFK, release 114, (PIDN:CAA57659
R;Huang, M.; Albach, R.A.; Chang, K.P.; Tripathi, R.L.; Kemp, R.G.
Biochim. Biophys. Acta 1260, 215-217, 1995
Biochim. Biophys. Acta 1260, 215-217, 1995
A;Tille: Cloning and sequencing a putative pyrophosphate-dependent phosphofructokinase
A;Reference number: S52082; MUID:95143279; PMID:7841199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross-references: EMBL:X82173; NID:g558573; PIDN:CAA57659.1; PID:g558574
R;Bruchhaus, I.; Jacobs, T.; Denart, M.; Tannich, E.
Biochem. J. 316, 57-63, 1996
A;Title: Pyrophosphate-dependent phosphofructokinase of Entamoeba histolyt
A;Reference number: S68243; MUID:96235172; PMID:8645233
A;Accession: S68243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Reference number: S49
A;Accession: S49458
A;Molecule type: mRNA
A;Residues: 1-436 CRNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Molecule type: mRNA
A; Residues: 1-429,'T',431-436 < BRU>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                submitted to the EMBL Data Library, A; Reference number: S49458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          R; Bruchhaus,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                $
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A; Accession: S52082
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RESULT 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    붕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5
                                                                                                                                                                                                                                                                                                                                                                                           Superfamily: pyrophosphate dependent phosphofructokinase; Reywords: phosphotransferase
                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                         Eh/PPi-PFK
    212
                                                                                                                               140
                                                                                                                                                                                                                                                                                                           108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  323
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            285
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        274
                                                                                                                                                                         92
                                                                                                                                                                                                                                                             3
4
                                                                                                                                                                                                                                                                                                                              Similarity
NANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAI
                                                                                                                               -VSDIHQKGGSILGTSR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AYNGIGLVKVMGRDSGFIAAHTA-
                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                            11.5%;
                                                                                                                                                                                                                                                                                                           68
                                                                                                                                                                                                                                                                                                                              Score 263.5; DB 1;
Pred. No. 3.5e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       October 1994
                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                         164;
```

```
214 NPRMLIVHEYMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                              KLDAVNPGKWFGEQFAQMIGAEK---TLVQ-KSGYFARASASNVDDMRLIKSCADLAVEC
AMAGKTKMLISLWSTKFVHIPIKMAVIDRNK-VNPNGSFWRDVLSSTGQP
                                                          AFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGOP
                                                                                                                                                                                                                                                            EGPNGFLVHLERRLLEKESLEBIPHAVILIAEGAG------
                                                                                                                                -GLYIKDKITEYFKAKNIQFTLKYIDPSYIIRSSPANASDSLYCARLGSNAVHA
                                                                                                                                                                                                                                                                                                                          ---akrl--revmdkvdcvnifvsbgagvbaivaemqakgqevp--rdafchi
                                                                                                                                                                                                                                                                                                                                                                                                ---LSSNDVNFCLIPELDFDI
                                                                                                                                                                                                                                                                -QKYFDHFPKKKDDSGNL
                                                                                                                                                                                                 378
                                                                                                                                                                                                                                                                                                                              322
                                                                                                                                                                                                                                                                                                                                                                                                284
                                                                                                                                                                                                                                                                336
```

2.7.1.90) 14-Apr-2003 [validated]

histolytica:

molecular

(PIDN: CAA57659.1

ω

PID:g529009

Length 436;

6-phosphofructokinase

16;

KVAILTAGGLAPCHNSAIGSLIERYTEIDPSIEIICYRGGYKGLL--LGDSYPVTAEVRK 91 KVAIVTCGGLCPGLNNVIRGLVLNLYNAYHVNNIFGLRWGYEGLVPELSEVQRLTPEI--Indels 71;

GTLRGANAINKELRRRKVPITVVGIPKTIDNDICYTDSTFGFQTAVGLSQEAINAVHSEA KAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGD 151 DTWTAAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAEN -GAQSPEVMAQFLIDNNPNILFTLGGD 271 241 211 181 139

```
유정
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    probable diphosphate-fructose-6-phosphate 1-phosphotransferase N;Alternate names: protein T2SK17.80 C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 30-Apr-1999 #sequence_revision 30-Apr-1999 #text_change C;Accession: T06011
R;Bevan, M; Rose, M; Hempel, S; Entian, K.D.; Bancroft, I.; submitted to the Protein Sequence Database, March 1999
                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Map position: 4
A;Introns: 46/2; 59/3; 80/3; 141/3; 194/3; 212/3; 235/3; 279/1; 367/3; 383/1; 434/3 C;Superfamily: pyrophosphate dependent phosphofructokinase; 6-phosphofructokinase 1 C;Keywords: phosphotransferase
                                                                                                       Ś
                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Molecule type: DNA
A;Residuem: 1-500 <BEV>
A;Residuem: 1-500 <BEV>
A;Cross-references: EMBL.AL049171; GSPDB:GN00062; ATSP:T25K17.
A;Experimental source: cultivar Columbia; BAC clone T25K17
                                                                                                                                                                             ક
                                                                                                                                                                                                                         유
                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                      망
                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Reference number: Z15382
A;Accession: T06011
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           음 성
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Gene: ATSP:T25K17.80
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뫉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local S
Matches 109
 455
                                                                                                                                                   345
                                                                                                                                                                                                                                                            259
                                                                                                                                                                                                                                                                                                249
                                                                                                                                                                                                                                                                                                                                                                            189
                                                                                                                                                                                                                                                                                                                                                                                                                                                    149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               334
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
 SSTNQP
                                     SEIGQP 428
                                                                       CTLLAQSAVHGAMAGYTGYI--
                                                                                                         IKSCADLAVECAFRRESGVIGHDEDNGNV---LRAIEFPRIKGGKPFNIDTD--WFNSML
                                                                                                                                                 --TLKDASGNKLLKDV--GLWLSQSIKDHFNQKKMVMNLKYIDPTYMIRAVPSNASDNVY 400
                                                                                                                                                                                                                                                            YEVHAVEVPEMAIDLEAEA-----KRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKG
                                                                                                                                                                                                                                                                                                                                      QGARYFMNYVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRES
                                                                                                                                                                                                                                                                                                                                                                          DRĞINQVYIİĞĞDĞİQRGASVIFEEIRRRGLKVAVİĞIPKTIDNDIPVIDKSFĞFDTAVE
                                                                                                                                                                                                                                                                                                                                                                                                              KDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                    AKNTVSLDSKV---VNDIHKRGGTILGTSR-------GGHDTTKI-VDSIQ 188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLV 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ILTAGGLAPCLNSAIGSL-----IERYTEIDPSIEIIC-----YRGGYKGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GLVICHHHNN---FVSVPIDRTSYYIK----RVNTDGPLYTMMSAIEKPK 436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G-VIGHDEDNGNVLRAIEFPR----IKGGKPFNIDTDW-FNSMLSEIGOPK 429
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INYLRDSITKYLKSIGIBEHTIKFVDPSYMIRSAPCSAADAHFCMCLANAAVHVAMAGKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VNPGKWFGEQFAQMIGAEKTLVQ--KSGYFARASASNVDDMRLIKSCADLAVECAFRRES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PITQICEFVGKR---IMSKGHVV-IVVAEGA-----LQNQKPKDLDLGTDKSGNILHWDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DL----BAEAKRIRBVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHI-KLDA 326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRL
                                                                                                                                                                                                                           RDVDCCLIPESPFYLEGEGGLFEYIEKRLKESGHMV----LVIAEGAGQDLMSKSMESM-
                                                                                                                                                                                                                                                                                                  EAQRAINAAHVEAESIENGIGVVKLMGRYSGFIA--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IVTCGGLCPGLNTVIREIVSSLSYMYGVKRILGIDVS---PCDCMLLLTKTNTGGYRGFY 148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
 460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       25.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 257.5; DB 2; Pred. No. 1.1e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 167;
                                                                       -SGLVNGROTYIPFYRITEKONHVVITDRMWAR-LL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              #text_change 14-Apr-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 500;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            I.; Mewes, H.W.; Mayer,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -DANLVLIPEIDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SE
                                                                                                                                                                                                                                                                                                  -MYATLAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2.7.1.90)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gaps
                                                                                                             422
                                                                                                                                                                                                                                                            311
                                                                                                                                                                                                                                                                                                                                                                            248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       333
                                                                       454
                                                                                                                                                                                                                           344
                                                                                                                                                                                                                                                                                                  289
                                                                                                                                                                                                                                                                                                                                        258
                                                                                                                                                                                                                                                                                                                                                                                                                  198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              282
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         T25K17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            X
'7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   рошо
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         . 80
```

C

```
A;ACCEBBLUMA
A;Molecule type: DNA
A;Residues: 1-473 <BEV>
A;Cross-references: EMBL:AL096692; GSPDB:GN00062; ATSP:T17A13.40
A; Map position: 4
A; Introns: 35/3; 51/2; 64/3;
C; Superfamily: pyrophosphate
                                                                                                                                                                                                                                                              pyrophosphate-dependent phosphofructo-1-kinase homolog T17A13.40 - Arabidop C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 13-Aug-1999 #sequence_revision 13-Aug-1999 #text_change 14-Apr-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A;Gene: TM0209
C;Superfamily: (
F;4-279/Domain:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                6-phosphofructokinase - Thermotoga maritima (strain MSB8)
C;Species: Thermotoga maritima
C;Species: 11-Jun-1999 #sequence_revision 11-Jun-1999 #text_change 12-May-2003
                                                                                                                                                                         A; Reference number: Z17683
A; Accession: T13433
                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Db
dd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Reference number: A72200; A; Accession: C72406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nature 399, 323-329, 1999
A; Title: Evidence for late
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;Nelson, K.E.; Clayton, R.A.; Gill, S.R.; Gwinn, M.L.; Dodson, R.J.; Haft, D.H.; Hi
Garrett, M.M.; Stewart, A.M.; Cotton, M.D.; Pratt, M.S.; Phillips, C.A.; Richardson,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C;Accession: C72406
R;Nelson, K.E.; Clay
                                                           A;Gene: ATSP:T17A13.40
                                                                                                                                                                                                              submitted to the Protein
                                                                                                                                                                                                                              R; Bevan, M.;
                                                                                                                                                                                                                                                  C; Accession:
                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Cross-references: GB:AE001705; G
A;Experimental source: strain MSB8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A; Residues: 1-319 < ARN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A, Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Molecule
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           POCET
                                                                                                                                                                                                                                                                                                                                                                                                    237
                                                                                                                                                                                                                                                                                                                                                                                                                                       331
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ű
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95;
                                                                                                                                                                                                                              Lennard, N.; Quail, M.; Harris, B.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LEAEAKRLREV--M9KVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNPG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AMPRMLIVHEVMGRNCGWLTAATAQEYRKULDRAEWLPBLGLTRESYEVHAVEVPBMALD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLT-----GAHLLYEEHKIPVVGIPATIONDIGLTDMCIGVDTCLNTVMDAVQKLKDTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TWTAAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGITEK-GGTILRTSRCEEFKT-----EEGRELAAKQIKKHGIEGLVVIGGEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKK 92
                                                                                                                                                                                                                                                                                                                                                                                                                                       KWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDWRLIKSCADLAVECAFRRESGVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YSQLADRILÉERRRGKINSI-ÍIVAÉGAASAYTVAR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SHERAFIV-EVMGRHSGYIALMAG----LVTGAE---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6-phosphofructokinase,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               6-phosphofructokinase, bacterial type; 6-phosphofructokinase 1 homology <6PF>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                                      -YRIGYÉ-TRITILGHVQRGGSPTAFDRRLALSMGVBAVDALLDGEVDVM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lateral gene transfer between Archaea
2200; MUID:99287316; PMID:10360571
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11.1%;
                                                                                                                                                                                                            Sequence Database, July
 85/3; 131/3; 202/3; 225/3; 269/1; 358/3; 373/1; 424/3 dependent phosphofructokinase; 6-phosphofructokinase; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 253; DB 2;
Pred. No. 1.3e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GB:AE000512; NID:g4980694;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches 126;
                                                                                                                                                                                                              Rajandream,
1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -----AIIVPEIPVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 319;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   6-phosphofructokinase 1 homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PIDN: AAD35301.1;
                                                                                                                                                                                                                                3. A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Bacteria
                                                                                                                                                                                                                                Barrell,
                                                                                                                                                                                                                                                                                                        Arabidopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                      284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  57
                                                                                                                                                                                                                                  w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PID: 9498071
                                                                                                                                                                                                                                  .
G
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            genome
                                                                                                                                                                                                                                                                                                          thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Hickey
                                                                                                                                                                                                                                    Bancro
           mod
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S O
```

```
A,Title: Limited proteolysis of yeast phosphofructokinase. A,Reference number: S38963; MUID:94039086; PMID:8223596
A,Accession: S38963
A,Molecule type: protein
A,Residues: 1-6;90-97;197-205;914-921 <KOP>
R;van der Aart, O,J.M.; Kleine, K.; Steensma, H.Y.
submitted to the EMBL Data Library, June 1995
A;Description: Sequence analysis of the 43 KB CRMI-YLM9-PET
A;Accession: S57708
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 10
JQ0016
                                                                                                                   A:Cross-references: EMBL:XB7941; NID:g886908; PIDN:CAA61193.1; PID:g886937 A;Experimental source: strain S288C R;Guerreiro, P.; Barreiros, T.; Azevedo, D.; Rodrigues-Pousada, C. submitted to the Protein Sequence Database, May 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          6-phosphofructokinase (BC 2.7.1.11) alpha chain - yeast (Saccharomyces cerevisiae) N;Alternate names: phosphofructokinase 1; phosphohexokinase; protein 194; protein C;Species: Saccharomyces cerevisiae
C;Date: Saccharomyces cerevisiae
C;Date: 31-Mar-1990 #sequence revision 14-Jul-1994 #text_change 12-May-2003
C;Accession: JQ0016; S38963; S57708; S64566; S64564; S63924
R;Heinisch, J.; Altzel, R.G.; von Borstel, R.C.; Aguilera, A.; Rodicio, R.; Zimmer Gene 78, 309-321, 1989
                          A; Molecule type: DNA
A; Residues: 1-987 < GI
                                                                            A;Accession: S64566
                                                                                                    A; Reference number: S64565
                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 794-987 < VAN>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Cross-references: EMBL:M26943; NID:g172137; PIDN:AAA34859.1; R;Kopperschiaeger, G.; Baer, J.; Stellwagen, E. Eur. J. Biochem. 217, 527-533, 1993
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-987 < HEI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: JQ001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Gene 78, 309-321, 1989
A;Title: The phosphofructokinase genes of yeast evolved A;Reference number: A91608; MUID:89378757; PMID:2528496
A;Cross-references: EMBL:Z73025;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             F;95-405/Domain: 6-phosphofructokinase 1 homology <6PF>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            403
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       330 GKWFGEQFAQMIGAEKTLVQK---SGYFARASASNVDDMRLIKSCADLAVECAFRRESGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               217
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            37 ILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVL 96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      I-GHDEDNGNVLRA----IEFPRI--KGGKPFNIDTDWFNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MAGYNGFTVGLVNGRHTYIPFNRITEKQNKVVITDRMWAR-LLSSTNQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GIGLVKLMGRYSGFIA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   HRSGGTILGTSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GEWISQRIKDHFAKKWILILKYIDPTYMIRAVPSNASD----NVCCTLLAQSAVH---GV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GGLFEFIDKRLKESGHMV----IVIAEGAGQDLLSESM--KESTTLKDASGNKLLQDI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A-----KREREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAAI FEBIRKRKLKVAVAGI PKTIDNDI PI I DRSFGFDTAVEEAQRAINAAHVEATSFEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AADLAAFLARMNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMMVVAENNANPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTA 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IVTCGGLCPGLNTVIREIVCGLSYMYGVKRILGIDGGYRGFYARNTIHLDL---KTVNDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                          SOUE >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        11.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60;
NID:g1323434; PIDN:CAA97268.1; PID:g1323435; GSPDB:GN00
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 251; DB 2; Length 473; Pred. No. 3.1e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -GÉHNTTKI-VÓSIQDRĞINQVYIİĞĞDĞSQKG
                                                                                                                                                                                                                                                                                                                         CRM1-YLM9-PET54-SMI1-PHO81-YHB4-PFK1 regio
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --- MHATLASRDVDCCLIPESPFFLEGS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              174;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence locations of cleavay
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A.; Rodicio, R.; Zimmermann,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CWO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PID:g172138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      450
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     duplication events
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         329
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          276
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              196
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     G8599
```

RESULT S32902

片

```
δ
                                                                                               밁
                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C;Keywords: ATP; glycolysis; phosphotransferase
F;208-517/Domain: 6-phosphofructokinase 1 homology <6PF1>
F;596-888/Domain: 6-phosphofructokinase 1 homology <6PF2>
F;225,229/Binding site: AMP, allosteric (Arg) #status predicted
F;309,310/Binding site: ATP (Asp, Gly) #status predicted
F;309,540ctive site: Asp #status predicted
F;398,455,482,488,491,729/Binding site: fructose-6-phosphate (Met, F;751/Binding site: citrate, allosteric (Lys) #status predicted
                                                                                                                                          5
                                                                                                                                                                                               片
                                                                                                                                                                                                                                                                                                  몽
                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                  망
                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         멼
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Map position: 7R
C;Superfamily: 6-phosphofructokinase, eukaryotic type; 6-phosphofructokinase 1 homology
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Cross-references: SGD:S0003472; MIPS:YGR240c
A;Map position: 7R
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A;Cross-references: EMBL:X87941; NID:g886908; PIDN:CAA61193.1; PID:g886937
A;Note: the nucleotide sequence was submitted to the EMBL Data Library, June 1995
C;Comment: Phosphofructokinase is composed of four alpha chains and four beta cha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        submitted to the Protein Sequence Database, May 1996
A;Reference number: S64541
A;Accession: S64564
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Title: Sequence analysis of the 43 kb CRM1-YLM9-PET54-DIE2-SMI1-PHO81-YHB4-PFK1 region A; Reference number: S63896; MUID:96267763; PMID:8701610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Experimental source: strain S288C
R; van der Aart, Q.J.M.; Kleine, K.; Steensma,
Yeast 12, 385-390, 1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Experimental source: strain S288C R;van der Aart, Q.J.M.; Steensma, H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Accession: S63924
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Cross-references: EMBL:Z73025; GSPDB:GN00007; MIPS:YGR240c
A;Experimental source: strain S288C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Molecule type: DNA
A;Residues: 794-987 <VAW>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Molecule type:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \;Molecule type: DNA
\;Residues: 794-987 <VAF>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Status: nucleic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SGD: PFK1; MIPS: YGR240c
558
                                                                                                                                                                                                  458
                                                                                                                                                                                                                                                    299
                                                                                                                                                                                                                                                                                                                                                                                                                                                       188
                                                                                                                                                                                                                                                                                                                                                                                                    363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         146
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         204 KKKKIAVMTSGGDSPGMNAAVRAVVR--TGIHFGCDVFAVYEGYEGLLRGGKY-----LK 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity 23.9
03; Conservative
  DKAISLRDTEF
                                                                                                  AVEE----FTPETPSPLIGILENKIIRMPLVESVKLTKSVA
                                                                                                                                                                                                                                                                                                                                                                                                    DSTIGAYSALERICEMVDYIDATAKSHSRAFVV-EVMGRHCGWLALMAGIATGADY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VVCGGDGSLT-GADLFRHEWPSLVDELVÅEGRFTKEEVAPYKNLSIVGLVGSIDNDMSGT 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HTIGGDDINTAAADL-----AAFLARNNY-
                                               DNGNVLRAIEF
                                                                                                                                                  TLVQKSGYFARASASN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                       KQSLGAWTAABQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLT----AATAQEYRKLL 243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KKA-----GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDIL 145
                                                                                                                                                                                                  LDDQLNPVTANDVKDALIEL----GLDTKVTILGHVQRGGTAVAHDRWLAT---LQGVDAVK
                                                                                                                                                                                                                                                                                                                                                    DRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCV-----NIFVSEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KMAWEDVRGWLSE-GGTLIGTA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   acid sequence not shown; translation
                                                                                                                                                                                                                                               -GVEAIVAEMQAKGQEVPRDAFGHIKL--DAVNPGKWFGEQFAQMIGAEK 345
                                               402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10.8%; Score 246.5; DB 1; 23.9%; Pred. No. 1.8e-09; tive 68; Mismatches 135;
                                                                                                                                                                                                                                                                                                  -IFIPÉRAVPHGKWQDELKÉVCQRHRSKGRRNNTÍIVAÉGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     H. Y.
                                                                                                                                                  VDDMRLIKSCADLAVECAFRESGVIGHDE 391
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                H.Y
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - RSMEFRKREGRRQAAGNLISQGIDAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       --GLTVIGLPKTVDNDVPPI 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        not.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        shown
                                                                                                     TATENKOF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Glu, Lys, His,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                  557
                                                                                                                                                                                                                                                                                                  457
                                                                                                                                                                                                                                                                                                                                                                                                    417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Arg, e
```

```
A; Molecule type: DNA
A; Residues: 1-462 <BEV>
A; Cross-references: EMBI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6-phosphofructokinase (BC 2.7.1.11) alpha chain - yeast (Kluyveromyces marxianus (Species: Kluyveromyces marxianus var. lactis, Candida sphaerica C.Date: OB-Dec.1993 #sequence_revision 03-Aug-1995 #text_change 12-May-2003 C;Accession: S32902; S29602 R;Heinisch, J.; Kirchrath, L.; Liesen, T.; Vogelsang, K.; Hollenberg, C.P. Mol. Microbiol. 9, 559-570, 193 Mol. Microbiol. 9, 559-570, 193 A;Title: Molecular genetics of phosphofructokinase in the yeast Kluyveromyces lack. Reference number: S32902; MUID:93316853; PMID:8326866
                A; Experimental source: C; Genetics:
                                                                                                                                             probable diphosphate-fructose-G-phosphate 1-phosphotransferase (N;Alternate names: protein T16118.50 C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 16-Jul-1999 #sequence_revision 16-Jul-1999 #text_change C;Accession: T16691 R;Bevan, M.; Lennard, N.; Quail, M.; Harris, B.; Rajandream, M.A submitted to the Protein_Sequence Database, June 1999
                                                                                                                                                                                                                                                                                   RESULT 12
T10691
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Gene:
C;Superf
A; Gene:
                                                                                                             A; Reference number: Z16533
A; Accession: T10691
                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                       ğ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ద
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     뫉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Superfamily: 6-phosphofructokinase, eukaryotic type; 6-phosphofructokinase 1 homology
C;Keywords: ATP; phosphofransferase
F;186-495/Domain: 6-phosphofructokinase 1 homology <6PF1>
F;574-866/Domain: 6-phosphofructokinase 1 homology <6PF2>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-992 < HEI>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A; Cross-references: EMBL: Z17315; NID: g2879; PIDN: CAA78963.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Accession: S32902
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ESCal
ATSP: T16118.50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             396
                                                                                                                                                                                                                                                                                                                                                              549
                                                                                                                                                                                                                                                                                                                                                                                                  405
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      344
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            239
                                                                                                                                                                                                                                                                                                                                                                                                                                         494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30 NKPKKVAILTAGGLAPCLNSAIGSLIERYTBIDPSIBIICYRGGYKGLLLGDSYPVTAEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWL----TAATAQEYRKLLDRA
                                                                                                                                                                                                                                                                                                                                                                                                                                         NMTPETPSPLIGILENKVIRMPLVES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DDQLNPITAS-QVKDVLVELGLDTKITTLGHVQRGGTAVAHDRWLAT--LQGVDAVKAIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EWIPELGLTRESYEVHAVEVPEMAI -----DLEAEAKRIREVMDKVDCVNIFVSEGA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IGGDGSLTGADLFRSEWPSLVEELVKDGKFTEDEVALYQNLTIVGMVGSIDNDMSGTDST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        XDVRGWLSE-GGTLIGTAR------SKEFRERWGRKQACSNLIDQGIDALVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SKKKKIAVMTSGGDSQGMNAAVRAVVR--SSIYYGCDVYAVYEGYEGLVKGGDYLRKMEW
                                                                                                                                                                                                                                                                                                                                                            LYSNEMSTTVNDDGSQLLPEADRLNIAIVHVGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ---GVEAIVAEMQAK------GQEVPRDAFGHIKL--DAVNPGKWFGBQFAQMIGAEKTLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IGAYSALERICEMVDYIDATAKSHSRAFVV-EVMGRHCGWLGLMSGIATAADY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IGGDDTNTAA-----ADLAAFLARNN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGED--PQKVAADQLVKDGVDILHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OKSGYFARASASNYDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPR
                                  EMBL:AL049915; GSPDB:GN00062; ATSP:T16I18.50
                                                                                                                                                                                                                                                                                                                                                                                                  KGGKPFNIDTDWFNSMLSEIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10.7%; Score 245.5; DB 2; Length 992; 23.8%; Pred. No. 2.1e-09; tive 74; Mismatches 165; Indels 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -VKLTKQVAAAIEAKDFDKAISLRDTEFIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ----YGLTVIGLPKTVDNDVFPIKQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 2;
                                                                                                                                                                                                                                                                                                                                                            582
                                                                                                                                                                  М.А.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PID: 92880
                                                                                                                                                                                                                                                                 80
                                                                                                                                                                                                        14-Apr-2003
                                                                                                                                                                    Barrell,
                                                                                                                                                                                                                                                                 2.7.1.90)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         89
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     238
                                                                                                                                                                                                                                                                                                                                                                                                                                         548
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                19;
                                                                                                                                                                      В.G.
                                                                                                                                                                                                                                                                 T16118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     lactis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       var.
                                                                                                                                                                      Bancr
                                                                                                                                                                                                                                                                 .50
                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           8
                                                  Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      맑
```

```
A;Map position: 4
A;Map position: 4
A;Introns: 35/3; 51/2; 64/3; 85/3; 131/3; 184/3; 202/3; 225/3; 269/1; 354/3; 371/1;
C;Superfamily: pyrophosphate dependent phosphofructokinase; 6-phosphofructokinase 1
C;Keywords: phosphotransferase
C;Keywords: 6-phosphofructokinase 1 homology <6PP>
                                                                                                                  A;Molecule type: mRNA
A;Residues: 1-141,'VTL',145-437 <KEM>
A;Cross-references: EMBL:U11733; NID:g511230; PIDN:AAA85791.1;
C;Superfamily: 6-phosphofructokinase, bacterial type; 6-phospho
C;Keywords: phosphotransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                  A; Reference number: S71070
                                                                                                                                                                                                                                                                                                       A; Molecule type: mRNA
A; Residues: 1-437 < WES>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                  A; Accession: S71070
                                                                                                                                                                                                                                                                                     A; Cross-references: EMBL: U11733
                                                                                                                                                                                                                                                                                                                                           A; Accession: S54978
                                                   Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                             352/Domain:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             u
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               105;
 27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   89 VRKKAGVLQRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       31 KPKKV--AILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAE
                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
TLMNKPKKY---AILTAGGLAPCLNSAIGSL-IERYTBIDPSIBIICYRGGYKGLLLGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LAVECAFRRESGVIGHDEDNGNVLRAIEFPRI--KGGKPFNIDTDWFNSMLSEIGOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SPFYLEGKGGLYEFIAKRLRENGHMV----IVIAEGAGQDLVABSIEQQDASGNKLLKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GGDDTNTAAADLAAFLARNNYGLTVIGLEKTVDNDVFFIKQSLGAWTAAEQGARYFMNVV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SAVHGAMAGYTGFVSGLVNGRHTY--IPFNRITERONKVVITDRMWAR-MLSSTNOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MAIDLEAE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VEATSVENGIGIVKLMGRYSGFIA-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AENNANPRMLI VHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GGDGTQKGANAIYKBIRRRGLKVAVAGIPKTIDNDIPVIDKSFGFDTAVEEAQRAINAAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --KTVSDIHKRGGTILGTSR--------GGHDTSKI-VDNIQDREINQVYII
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KESDVRACIVICGGLCEGLNIVIRBIVCGLHEMYGVTEVIGVDCGFRGFYSKNIVALIP-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FGHIKLDAVNFGKWFG----EQFAQMIGAEKTLVQ-KSGYFARASASNVDDMRLIKSCAD
                                                                                                       6-phosphofructokinase 1 homology <6PF>
                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              10.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GLWMSLKIKEYFAKHNVMDITLKYIDPTYMIRAIPANASDNVYSTLLAQ
                                                   10.6%;
                                                                                                                                                                                                                                                   Library,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AKRIREVMDKVDCVNIFVSEGAGVEAI - - - VAEMOAKGQEVPRDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               58;
                                    65;
                                                   Score 241.5; DB 2;
Pred. No. 1.3e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 243; DB 2;
Pred. No. 1.1e-09;
                                                                                                                                                                                                                                                     July
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches 178;
                                    Mismatches
                                                                                                                                                                                                                                                                                                                                                              n of the pyrophosphate-dependent phosphofructory PMID:7717968
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ------MYATLASRDVDCCLIPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 462;
                                                                                                                                             6-phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                      Length
                                  Indels
                                                                      437;
                                                                                                                                                               PID:g511231
                                  79;
                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 318
 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          373
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     289
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        268
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            88
                                  24;
                                                                                                                                           homology
```

TTIVTEKNVETLGVLVGGGEAPGINGVÍGAVTÍE---AINNGYRVLGFLEGEQNLILQDD

65

		PTGKTRTRQVDVS 389 Inase [imported] - Salmonella enterica subsp. enterica serovar Typhi iella enterica subsp. enterica serovar Typhi ies has also been called Salmonella typhi ies has also been called Salmonella typhi ies sequence_revision 09-Nov-2001 #text_change 12-May-2003 42 OUGAIN, G., James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; Churc C.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N.; Par O'Gaora, P. C.; Quall, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, Condone sequence of a multiple drug register Salmonella serverica of the control	257 ESYEVHAVFVPEME 224 DSTEPEVTPSRICDMY 313 EVPRDAPGHIKLDAVD 313 EVPRDAPGHIKLDAVD 314 EVPRDAHDHIMLAELL 279 SLKYDAHDHIMLAELL 369 KSCADLAVECAPRRES 369 KSCADLAVECAPRRES 379 RDLGNGAVRYLLNGGN 427 QPKGGKVEVS	Qy 83 YPVTAEVRKAGVLQRFGGSVIGNSRVKLTNVXDCVKRGLVKEGEDPQKVAADQLVXDGV 142 66 SKIVELTIDSVSRIHFEGGSILKTSRANPT
C;Keywords: allosteric regulation; ATP; glycolysis; homotetramer; phosphotransferase F;5-279/Domain: 6-phosphofructokinase i homology <6PF1> Guery Match Best Local Similarity 24.9%; Pred. No. 1.4e-09; Matches 100; Conservative 65; Mismatches 132; Indels 105; Gaps 18; Qy 33 KKVALLTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTA 87	A;Reference number: A94501 A;Contents: annotation; corrections R;Contents: annotation; corrections R;Cite Annotation; corrections R;Cite Annotation; corrections R;Cite Annotation; corrections A;Reference number: \$40802; MUID:93347969; PMID:8346018 A;Recession: \$	type: DNA i 1-320 <blat asi144;="" beer="" data="" embl="" gb:="" gb:ae000466;="" has="" iferences:="" intal="" into="" k-12,="" library,<="" muid:852="" sequence="" since="" source:="" strain="" td="" the=""><td>11) 1 - Escherichia coli (sokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1; place, C.A.; Perna, N.1 G.; Bloch, C.A.; Perna, N.1 Y. puence of Escherichia coli Py. puence of Escherichia coli Py. puence of Escherichia coli Py.</td><td>Db 201DLVABIKAGIAKGKKHAIVAITEHMCDVDELAHFIEKETGRETRATVLGHIQRG 254 Qy 311 GQEVPRDAFGHIKLDAVNPGKMFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKS 370 </td></blat>	11) 1 - Escherichia coli (sokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1, isozyme 1; phosphokinase 1; place, C.A.; Perna, N.1 G.; Bloch, C.A.; Perna, N.1 Y. puence of Escherichia coli Py. puence of Escherichia coli Py. puence of Escherichia coli Py.	Db 201DLVABIKAGIAKGKKHAIVAITEHMCDVDELAHFIEKETGRETRATVLGHIQRG 254 Qy 311 GQEVPRDAFGHIKLDAVNPGKMFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKS 370

Search completed: January 29, 2004, 14:38:27 Job time : 22 secs

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        E E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Minimum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Database :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Max1mum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        91.
  Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   88
  281.5
271.5
271.5
271.5
271.5
246.5
245.5
245.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
233.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                seq.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    protein search,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query
Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       BLOSUM62
Gapop 10.0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        127863 seqs,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-941-947A-2
2284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     January 29, 2004, 14:08:27;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 DVVTWPYHLTADIRFCHWFF...
  SwissProt_41:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Copyright
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GenCore version
(c) 1993 - 2004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              BG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              47026705 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  using
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gapext 0.5
                                                                                                                                                                                                                   PEP PROPR
KGPI STRCO
PEP DICTH
PEP AMYME
KGPI STRCO
PEP AWYME
KGPI STRCO
PEP AWYME
KGPI STRCO
PEP AWYME
KGPI STRCO
PEP AWYME
KGPI THEMA
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TAGST
KGPI TA
                    K6PF_LACLA
K6PF_YARLI
K6PF_BUCAP
K6PF_RABIT
K6PF_CLOAB
K6PF_STRP3
K6PF_STRP9
K6PF_STRP9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ŝ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       mode1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   .....FNSMLSEIGQPKGGKVBVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; Search time 17 Seconds (without alignments)
1208.863 Million cell upo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Compugen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              P29495 p pyrophosp
O0833 streptomyce
O9kh71 d pyrophosp
O59126 a pyrophosp
O59126 a pyrophosp
O94129 streptomyce
O9agc0 a pyrophosp
O91118 streptomyce
O9wycz thermotoga
P16861 saccharomyc
O03215 kluyveromyc
                    Q9k843
P59563
Q9knp2
O53257
Q07636
Q07636
P59680
P59680
P60511
O68308
Q8k7a2
Q8p0s6
                                                                                                                                                                                                                                                                                                                                                                                                                 Q8xnh2
Q8xg19
P06998
Q8zj16
Q59214
P80019
                                                                                                                                                                                                                                                                                                                   0926c3
P21777
Q9rwn1
                                                                                                                                                                                                                                                                                                                                                                                          Q8rg98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Description
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              cell updates/sec
                    de cryctolagus
clostridium
streptococc
streptococc
streptococc
                                                                                                                                                                                                                                                                                                                                                                                       5 yersinia pe
4 bacillus ma
9 lactobacill
6 fusobacteri
                                                                                                                                       / mycobacteri
lactococcus
yarrowia li
buchnera ap
                                                                                                                                                                                                                                                             deinococcus
bacilius ha
buchnera ap
                                                                                                                                                                                                                                                                                                                                        enterobacte
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    clostridium
salmonella
                                                                                                                                                                                                                                             vibrio chol
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   437
musculu
```

TTWEER REPORT OF THE PROPERTY

-

SUBFAMILY.

-

Biochemistry 31:4815-4821(1992).
-!- CATALYTIC ACTIVITY: Diphosphate + D-fructose

+

-

phosphate + D-fructose 1,6-bisphosphate.
ENZYME REGULATION: NON-ALLOSTERIC.
PATHWAY: Key control step of glycolysis.
SUBUNIT: Homodimer.
SIMILARITY: BELONGS TO THE PHOSPHOFRUCTOKINASE FAMILY. PPP

IDENTIFICATION OF CRITICAL LYSYL RESIDUES.

MEDLINE=92273593; PubMed=1317210;

MEDELINE=92273593; PubMed=1317210;

MEDLINE=92273593; PubMed=1317210;

MEDLINE=92273593; PubMed=1317210;

MEDLINE=92273593; PubMed=1317210;

MEDLINE=92273593; PubMed=13293;

MEDLINE=92273593; MEDLINE=92273593;

MEDLINE=92273593; MEDLINE=92273593;

MEDLINE=92273593; MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92273593;

MEDLINE=92

phosphofructokinase from Propionibacterium freudenreichii.";
J. Biol. Chem. 266:16550-16555(1991).

This SWISS-PROT entry is copyright. It is produced through a collabora between the Swiss Institute of Bioinformatics and the EMBL outstati the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commer entities requires a license agreement (See http://www.isb-sib.ch/annou or send an email to license@isb-sib.ch).

moved. Usage by and for commercial (See http://www.isb-sib.ch/announce/

a collaboration

Transferase; Kinase. INIT_MET 0 NP_BIND 120 1

125

PYROPHOSPHATE (POTENTIAL).

InterPro; IPR000023; Ppfruckinase. Pfam; Pr00365; PFK; 1. PRINTS; PR00476; PHPRCTKINASE. ProDom; PD000707; Ppfruckinase; 1.

EMBL; M67447; AAA25675.1; PIR; A41169; A41169.

	60000004444444444444444444444444444444	214.5 213.5 213.5 212.2 210.5 210.5 210.5 210.2 210.2 210.2 210.2 210.2	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	335 7781 7781 320 3189 3189	4444444444	KGPF STRPN KGPF STRTR KGPF AQUAB KGPP ASPOR KGPF AOUSB KGPF BUCAI KGPF WYCLB KGPF HABCO KGPP BACST	:	Q97rc6 Q97sc6 Q6719e3 Q676g20 Q9fg20 P52784 P547857 P5478 P5478 P5478 P5478 P5478 P5478 P5478 P5478 P5478 P5478 P5478	streptococc streptococc aquifex aeo aspergillus canis famil mus muscullu buchnera ap mycobacteri homo sapien haemonchus candida alb bacillus st
		213.5 213.5 210.5 210.5 210 210 210 210 209		3709 319 319		K6PF_ASPOR K6PF_MOUSE K6PF_BUCAI K6PF_BUCAI K6PF_HUMAN K6PF_HAECO K6PF_BACST K6PF_BACST	ö,	P52784 P52784 P547857 P547853 P033106 P08237 P08237 P094201	aspergillus canis famil canis famil mus musculu buchnera ap mycobacteri homo sapien haemonchus candida alb bacillus st
RESULT	' Si	LT 1 PROFR PFP PROFR	STANDARD;	DARD;		ALIGN	MENTS 403 AA.		
	01-10 11-10	01-APR-1993 01-APR-1993 15-SEP-2003 Pyrophosphate (6-phosphof- dependent 6-	(Rel. 25, (Rel. 25, I) (Rel. 25, I) (Rel. 42, I) Ge-fructose ructokinase, phosphofructokinase)	5, Cre 5, Las 2, Las 2, Las tose 6	Created) Last sec Last ann e 6-phos e 6-phos crose-1-	11-APR-1993 (Rel. 25, Created) 11-APR-1993 (Rel. 25, Last sequence update) 15-SEP-2003 (Rel. 42, Last amnotation update) Yrophosphatefructose 6-phosphate 1-phospho (6-phosphofructokinase, pyrophosphate depende dependent 6-phosphofructose-1-kinase) (PPi-de	01-APR-1993 (Rel. 25, Created) 01-APR-1993 (Rel. 25, Last sequence update) 15-SEP-2003 (Rel. 42, Last annotation update) 15-SEP-2003 (Rel. 42, Last annotation update) Pyrophosphatefructose 6-phosphate 1-phosphotransferase (EC 2. (6-phosphofructokinase, pyrophosphate dependent) (Pyrophosphate dependent 6-phosphofructose-1-kinase) (PPi-dependent	(BC	2.7.1.90) ate-
388888	Prog Prog Bact	phosphofructokinase) (PP1-PFK). PFP OR PFK. Propionibacterium freudenreichii Bacteria, Actinobacteria, Actino Brotionibacterineae, Propionibac	okinase okinase erium fi tinobact	(PPi (PPi reuder teria;			A = a	tales;	
	(T) NCB1	NCBI TaxID=1752;	752;	jord (0	ilbacteria	aceae; Fropionibacterium	terium.	
₽ R R	SEQU MEDI	SEQUENCE FROM N.A., AND PARTIAL SEQ MEDLINE=91358443; PubMed=1653240; Ladror U.S., Gollapudi L., Tripathi	4 N.A., 8443; Pi Gollapi	AND E ubMed= udi L.	, 168 168 168	SEQUENCE FROM N.A., AND PARTIAL SEQUENCE MEDLINE=91358443; PubMed=1653240; Ladror U.S., Gollapudi L., Tripathi R.L.	UENCE. R.L., Latshaw S.P.,	, Kemp	ສ.G.;
R 3	tt.	ming, se	inencing dation	g, and	e .	*Cloning, sequencing, and expression of	pyrophospi	depende	Ģ

```
ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뮹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Loca
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LTRCO
STANDARD; PRT; 342 AA.

K6P1 STRCO
STANDARD; PRT; 342 AA.

08333;
15-JUL-1998 (Rel. 36, Created)
15-JUL-1998 (Rel. 36, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
6-phosphofructokinase 1 (EC 2.7.1.11) (Phosphofructokinase
1 (FD 2.7.1.11) (Phosphofructokinase
1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
(Phosphohosokinase 1) (ATP-PFK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ACT_SITE
SEQUENCE
               STRAIN=A3(2) / M145;

STRAIN=A3(2) / M145;

Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Challis G.L.,

Bentley S.D., Chater K.D., Harris D.E., Quail M.A., Kieser H.,

Thomson N.R., James K.D., Harris D.E., Quail M.A., Kieser H.,

Harper D., Bateman A., Brown S., Chandra G., Chen C.W., Collins M.,

Cronin A., Fraser A., Goble A., Hidalgo J., Hornsby T., Howarth S.,

Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S.,

Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S.,

Seeger K., Saunders D., Sharp S., Squares K., Squares S., Taylor K.,

Warren T., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J.,

Hopwood D.A.,
                                                                                                                                                                                                                                                                            MEDLINE=97208211; PubMed=9055413;
Alves A.M.C.R., Euverink G.C.W., Bibb M.J., Dijkhuizen L.;
"Identification of ATP-dependent phosphofructokinase as a regulistep in the glycolytic pathway of the actinomycete Streptomyces coelicolor A3(2).";
                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI
                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomyces coelicolor.

Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
Streptomycineae; Streptomycetaceae; Streptomyces.
                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   153
                                                                                                                                                                                                                                                                Environ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      248;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ü
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AGDKLSVIDEKRIAGHKPEDITLDWYTQLLARIGQP 397
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NGNVLRAIEFPRIXGGKPFNIDTDWFNSMLSEIGQF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FAKQFAERIGAGKIMVQKSGYFSRSAKSNAQDLELIAATATMAVDAALAGTPGVVGQDEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FGEQFAQMIGAEKTIVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LDAEAERLRTVMDEVGSVNIFISEGAGVPDIVAQMQATGQEVPTDAFGHVQLDXINFGAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LEAEAKRIREVMDKVDCVNIFVSEGAGVBAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAPRELITHEIMGRNCGYLAAETSRRYVAWLDAQQWLPEAGLDRRGWDIHALYVPEATID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ANERWLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLEELGLTRESYEVHAVFVPEMAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YDRLFSFGGSPIGNSRVKLTNVKDLVARGLVASGDDPLKVAADQLIADGVDVLHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KVALLTAGGFAPCLSSAIAELIKRYTEVSPETTLIGYRYGYEGLLKGDSLEFSPAVRAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TNTTAADLAAYLAQHDYPLTVVGLPKTIDNDIVPIRQSLGAWTAADEGARFAANVIAEHN
 genome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              150
403 /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AA;
                                                                                                                                                                                                                                                              Microbiol.
                                                                                                                                                                                                                                                                                                                                                                          1109
 sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            150
43114
                                                                                                                                                                                                                                                                                                                                                                                          AND CHARACTERIZATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     57.5%;
62.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ¥.
   of the
                                                                                                                                                                                                                                                              63:956-961(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pred. No. 1.2e
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1314;
Pred. No. 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUCLEOPHILE (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1DED3272B4A2B6E6
   mode1
   actinomycete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .2e-81;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      88; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
Streptomyces
                                       s., Taylor K., Parkhill J.,
                                                                                                                                                                                                                                                                                                                   a regulatory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ċ,
                                                                                                           ωz
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    0,
```

RESULT
PFP_DIO
ID PI
AC QI
DT 11
DT 11

P_DICTH
PP DICTH
Q9XH71;
15-SEP-2003
15-SEP-2003
15-SEP-2003

(Rel. 42, Created) (Rel. 42, Last seq (Rel. 42, Last ann

sequence update)

update)

STANDARD;

PRT;

346

Š

```
융
               S
                                                    밁
                                                                           8
                                                                                                           밁
                                                                                                                                S
                                                                                                                                                                    밁
                                                                                                                                                                                              Ś
                                                                                                                                                                                                                            몽
                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                     붉
                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                           용
                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HAMAP; P00512; 3PFK.
HAMAP; MF 00339; -; 1.
InterPro; TPR000023; Ppfruckinase.
Pfam; PP00365; PPK; 1.
PRINTS; PR00476; PHFRITKINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  coelicolor A3(2).";
Nature 417:141-147(2002).
-i- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ProDom; PD000707; Ppfruckinase; 1.
PROSITE; PS00433; PHOSPHOPRUCTOKINASE; 1.
Kinase; Transferase; Glycolysis; Multigene family; Allosteric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AL939111; CAB51967.1; PIR; T35500; T35500.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and foentities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         between
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; U51728; AAC45135.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            s SWISS-PROT entry is copyright. It is produced through a collai ween the Swiss Institute of Bioinformatics and the EMBL outst Buropean Bloinformatics Institute. There are no restrictions by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PATHWAY: Key control step of glycolysis.
SUBUNIT: Homotetramer (By similarity).
SUBCELLULAR LOCARION: Cytoplasmic (By similarity).
SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fructose 1,6-bisphosphate.
ENZYME REGULATION: ALLOSTERICALLY INHIBITED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PHOSPHOENOLPYRUVATE.
                                                       248
299
                          385
                                                                                 326
                                                                                                              200
                                                                                                                                           274
                                                                                                                                                                     161
                                                                                                                                                                                               214
                                                                                                                                                                                                                              106
                                                                                                                                                                                                                                                          154
                                                                                                                                                                                                                                                                                       59
                                                                                                                                                                                                                                                                                                                                                                                                     al Similarity 27.4
105; Conservative
                                                                                                                                                                                                                                                                                                                 94
                                                                                                                                                                                                                                                                                                                                                                          3
4
                                                                                                                                                                                                                                                                                                                                                ы
                                                                                                                                                                                                                                                        NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                      GVIGHDEDNGNV--LRAIEFPRI
                                                       ٩٧<u>-</u>
                                                                                 AVNPGKWFGEQFAQMIGAE-KTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRES
                                                                                                                                                                       HMRVLVV-EVMGRHAGWIALHS
                                                                                                                                                                                                 NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                     GILPR-GGTVLGSSRTNPLKQRDGIRR-----IKDNLAALGVEALITIGGEDT
                                                                                                                                                                                                                                                                                                                                                KVGVLTGGGDCPGLNAVIRAVVRKGVQ-BYGYDFTGPRDGWRGPLEGDTVPL--DIPAVR
                                                                                                                                                                                                                                                                                                                                                                          KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                              EQVCSWVTSRFRASYAPI----VVVAEGA-----
                                                                                                                                          EA----EAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPR---
                                                                                                                                                                                                                              LGVÅTRLÅ-----DEYGVPCVGVPKTIDNDLSATDYTFGFDTAVGIATEAIDRLHTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                342
                                                    -GEWLAKQI EKRTGNEARTTV--LGHVQRGGTPSAFDRWLATRFGLHAVDCV--
HDGDFGKMVALRGTDIVRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                AA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                              36664 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                   13.6%;
                                                                                                                                                                                                                                                                                                                                                                                                    ; Score 311; DB 1; I; pred. No. 5.1e-14; 63; Mismatches 137;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                CEEFC7B74092AB34 CRC64;
                          405
317
                                                                                                                -MPRDGDWVLKDESLDSYGHVRLS
                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                       GLAGGA---NVILIPEORFDV
                                                                                                                                                                                                                                                                                                                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                       78;
                                                                                                                                           -DAFGHIKLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                  273
                                                                                                                                                                                                                              160
                                                                                                                                                                                                                                                          213
                                                                                                                                                                                                                                                                                       105
                                                                                                                                                                                                                                                                                                                  153
                                                                                                                                                                                                                                                                                                                                                58
                                                                                    384
                                                                                                                247
                                                                                                                                                                       199
                                                                                                                                                                                                                                                                                                                                                                                                       17;
```

```
吊
                       8
                                                        밁
                                                                            S
                                                                                                                밁
                                                                                                                                      S
                                                                                                                                                                 망
                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                             ď
                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRINTS; PR00476; PHFRCTKINASE.
PRODOM; PD000707; Ppfruckinase; 1.
PROSITE; PS00433; PHOSPHOPRUCTOKINASE; FALSE_NEG.
Kinase; Transferase; Glycolysis.
SEQUENCE 346 AA; 37448 MW; 50C03B64BA7927F1 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     the Buropean Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HAMAP; MF_00339; -; 1.
InterPro; IPR000023; Ppfruckinase
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AF268276; AAF80100.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pyrophosphate--fructose 6-phosphate 1-phosphotransferase (EC 2.7.1.90) (6-phosphofructokinase, pyrophosphate dependent) (Pyrophosphate-dependent 6-phosphofructose-1-kinase) (PPi-dependent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=20372656; PubMed=10913106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Dictyoglomus thermophilum.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 phosphofructokinase)
                            393
                                                        256
                                                                                                                  201
                                                                                                                                              274
                                                                                                                                                                            162
                                                                                                                                                                                                                                     108
                                                                                                                                                                                                                                                              154 NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSIGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                 107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              $86690d
                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                         94
                                                                                                                                                                                                                                                                                                                                                                                   34
                                                                                                                                                                                                                                                                                                                                                       ហ
                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                               NPRMLIVHEVMCRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYBVHAVFVPEMAIDL
                                                                                                                                                                          HARVIVV-EIMGRHAGWLAL----YGGLAGGADY-
                                                                                                                                                                                                                                 LGVASKF-----SKLGLPMIGVPKTIDKDLEETDYTLGFDTAVEVVVDAIKRLRDTARS
                                                                                                                                                                                                                                                                                                                                                    RIGVLTGGGDCPGLNPAIRGIVMR--ALDYGDEVIGLKYGWAGLLKADTMPLSLEMVED-
KGNELVPVDITLIE-GKTKNVDPAFYESV 340
                            NGNVLRAIEFPRIKGGKPFNIDTDWFNSM 421
                                                      LABEIQKNLGIETRAVILS-HLQRGGSPSIRDRIMGLLLGKKAVDLVHEGKSGLF--VAV
                                                                                   FGEQFAQMIGAEKTLYQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED
                                                                                                                  EDLYNHIRKLYARGRNHAVVAIAEGVQLPGFTYQ-
                                                                                                                                           EAEAKRIREVMDK-VDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKIDAVNPGKW
                                                                                                                                                                                                                                                                                                --ILEIGGTILGSSR---
                                                                                                                                                                                                                                                                                                                      GVLQRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                KVAILTAGGLAPCLNSAIGSLIERYTBIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Dictyoglomi;
                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2PFK
                                                                                                                                                                                                                                                                                                                                                                                                            13.4%; Score 305; DB 1; Length 346; 27.5%; Pred. No. 1.3e-13; ive 73; Mismatches 155; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (PPi-PFK).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Dictyoglomales; Dictyoglomaceae; Dictyoglomus.
                                                                                                                                                                                                                                                                                             -TNP-----FKKEBDVQK-CVENFKKLNLDALIAIGGEDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        50C03B64BA7927F1 CRC64;
                                                                                                                  -KGQEGMVDAFGHIRLGGV--GNV
                                                                                                                                                                                                                                                                                                                                                                                                              Indels 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 the pip gene
                                                                                                                                                                          --ILIPEVEPNI
                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                    392
                                                                                                                255
                                                                                                                                                                         200
                                                                                                                                                                                                       273
                                                                                                                                                                                                                                   161
                                                                                                                                                                                                                                                               213
                                                                                                                                                                                                                                                                                             107
                                                                                                                                                                                                                                                                                                                        153
                                                                                                                                                                                                                                                                                                                                                    61
```

```
RESERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERVE SERV
                                                 Ś
                                                                                                                                                             δ
                                                                                                                                                                                                                             片
                                                                                                                                                                                                                                                                            ð
                                                                                                           먑
                                                                                                                                                                                                                                                                                                                                               맑
                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ß
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Sim
Matches 108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AMYME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a cobetween the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and foentities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Alves A.M., Meijer W.G., Vrijbloed J.W., Dijkhuizen L.;
"Characterization and phylogeny of the pfp gene of Amycolatopsis
methanolica encoding PPi-dependent phosphofructokinase.";
J. Bacteriol. 178:149-155(1996).
-!- CATALYTIC ACTIVITY: Diphosphate + D-fructose 6-phosphate =
phosphate + D-fructose 1,6-bisphosphate.
-!- PATHMAY: Key control step of glycolysis.
-!- SUBUNIT: Homotetramer.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15-JUL-1998 (Rel. 36, Created)
15-SEP-2003 (Rel. 42, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
15-SEP-2003 (Rel. 42, Last annotation update)
Pyrophosphate--fructose 6-phosphate 1-phosphotransferase (EC 2.7.1.90)
(6-phosphofructokinase, pyrophosphate dependent) (Pyrophosphate-
dependent 6-phosphofructose-1-kinase) (PPI-dependent
phosphofructokinase) (PPI-PFK).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Q59126;
15-JUL-1998
15-SEP-2003
15-SEP-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRINTS; PRO0476; PHFROTKINASE; PRODOM; PD0000707; PDfruckinase; 1.
PROSITE; PS00433; PHOSPHOFRUCTOKINASE; 1.
Kinase; Transferase; Glycolysis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HAMAP; MF_00339; -; 1.
InterPro; IPR000023; E
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; U31277; AAB01683.1; ALT_INIT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ESSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=96125240; PubMed=8550409
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NCBI_TaxID=1814;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bacteria; Actinobacteria; Actinobacteridae;
Pseudonocardineae; Pseudonocardiaceae; Amyco
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Amycolatopsis methanolica.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PEP AMYME
199
                                                                                                              160
                                                                                                                                                                                                                                106
                                                                                                                                                                                                                                                                                        154
                                                                                                                                                                                                                                                                                                                                               60
                                                                                                                                                                                                                                                                                                                                                                                                    94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                 EAEAKRIREVMDKVDCVNIFVSEGAGVBAIVAEMQAKGQBVPRDAFGHIKLDAVNPGKWF 333
                                                                                                                                                                NPRMLIVHEVMGRNCGWITAATAQ3YRKLLDRAEWLEELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                               NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSIGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                            -ILIR-GGTILGSSR---TNP-----YKEEGGVEKIRA-VLADQGVDALIAIGGEDT
                                                                                                                                                                                                                                                                                                                                                                                                    GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT 153
EQVVEWVERRFEKMYAPIIVVAEGAVPEG-GAEVLRTGE---KDAFGHVQLGGV--GTWL
                                                                                                              HYRAMVV-EVMGRHAGWIAL-
                                                                                                                                                                                                                             LGVAKKL-----TDDGIGVVGVPKTIDNDLAATDYTFGFDTAVHIATEAIDRLRTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                           RVGVLTGGGDCPGLNAVIRAVVRKGIEAH-GWEIVGFRSGWRGPLTGDSRPLGLDDVEE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  341 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  36229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AND PARTIAL SEQUENCE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ppfruckinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 298.5; DE
Pred. No. 3.5e-1
9; Mismatches 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  306613246172D36B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Amycolatopsis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             147;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Actinomycetales;
                                                                                                              -HAGLAGGA---NVILVPERPPSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               restrictions
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ٠.
ون
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               .ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ħ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          no
                                                                                                              198
                                                                                                                                                                                                                             159
                                                                                                                                                                                                                                                                                                                                               105
                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                  213
                                                                                                                                                                                                                                                                                                                                                                                                                                                              59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         93
```

```
Ş
                                 밁
                                                              Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                 Query Match
Best Local S
Matches 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDINE-199640, PubMed=12000953;

MEDINE-199640, PubMed=12000953;

Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Challis G.L.,

Thomson N.R., James K.D., Harris D.B., Quail M.A., Kieser H.,

Harper D., Bateman A., Brown S., Chandra G., Chen C.W., Collins M.,

Cronin A., Praser A., Goble A., Hidalgo J., Hornsby T., Howarth S.,

Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S.,

Rabbinowitsch E., Rajandream M.A., Rutherford K., Rutter S.,

Seeger K., Saunders D., Sharp S., Squares R., Squares S., Taylor K.

Marren T., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J.,
                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collabora between the Swiss Institute of Bioinformatics and the EMBE outstati the European Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commer entities requires a license agreement (See http://www.isb-sib.ch/annou or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    fructose 1,6-bisphosphate.
-!- PATHWAY: Key control step of glycolysis.
-!- SUBCELLULAR LOCATION: Cytoplasmic (By similarity).
-!- SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STRCO
                                                                                                                                                                              PRINTS; PR00476; PHFRCTKINASE.
PRODOM; PD000707; Ppiruckinase; 1.
PROSITE, PS00433; PHOSPHORRUCTOKINASE; 1.
Kinase; Transferase; Glycolysis; Multigene
                                                                                                                                                                                                                                              HAMAP; MF_00339; -; 1.
InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence up
28-FEB-2003 (Rel. 41, Last annotation
6-phosphofructokinase 3 (EC 2.7.1.11)
(Phosphohexokinase 3).
(PKA3 OR PEK3 OR SCC1214 OR 2SCG58.14
                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nature 417:141-147(2002).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           coelicolor A3(2)."
                                                                                                                                                                                                                                                                                               EMBL; AL939108;
HSSP; P00512; 3F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STRAIN=A3(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             K6P3_STRCO
Q9FC99;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "Complete genome sequence of the model actinomycete Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Streptomycineae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CATALYTIC ACTIVITY: ATP + D-fructose
                                                                                                   100;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              394
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               334
     94
                                                                  34
                                  N
                                                                                                                 Similarity
GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDFQKVAADQLVKDGVDILHTIGGDDT
                                 RIGVLTSGGDCPGLNAVIRSVVHR-AVVDHGDEVIGFRDGWKGLLECDY--LKLDLDAVG
                                                              KVAILTAGGLAPCHNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GTMVALRGTDIVRVK 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNV--LRAIEFPRIK 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ADEIAERTGKESRAV-VLGHTQRGGTPTAYDRVLATRFGLHAVDAV--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDEDN
                                                                                                                                                                 341 AA;
                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              coelicolor
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              / M145;
                                                                                                                                                                                                                                                                                               3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                             CAC01496.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomycetaceae;
                                                                                                                                                                ; Glycolysis; Multigene family; Complete proteome. 36431 MW; E3050D37BDB6F9F0 CRC64;
                                                                                                                 12.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Last sequence update)
Last annotation updat
3 (EC 2.7.1.11) (Phos
                                                                                                 66;
                                                                                                                 Score 281.5; DB 1;
Pred. No. 5e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Streptomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               341
                                                                                                                                                                                                                                                                                                                                                              (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             update)
(Phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             6-phosphate
                                                                                               152;
                                                                                                                               Length 341;
                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ADP
                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Taylor K.,
                                                                                                 55,
                                                                                                                                                                                                                                                                                                                                                                                                                                              collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               À
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ---- ADGDF 302
                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           တဒ
                                                                                                                                                                                                                                                                                                                                                                               commercial
                                 58
                                                                  93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             393
```

```
SAN TO THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF THE TRANSPORT OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PFP_AMY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              당
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AMYMD
                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collab between the Swiss Institute of Bioinformatics and the EMBL outset the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for commodified and this statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Submitted (JAN-2001) to the EMBL/GenBank/DDBU databases
-!- CATALYTIC ACTIVITY: Diphosphate + D-fructose 6-phosphosphate + D-fructose 1,6-bisphosphate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               pPP MYYD STANDARD; PRT; 341 AA.

Q9AGCO;
15-SEP-2003 (Rel. 42, Created)
15-SEP-2003 (Rel. 42, Last sequence update)
15-SEP-2003 (Rel. 42, Last sentence update)
Pyrophosphate--fructosee 6-phosphate 1-phosphotransferase (EC 2.7.1.90)
(6-phosphofructokinase, pyrophosphate dependent) (Pyrophosphate-dependent 6-phosphofructose-1-kinase) (PPi-dependent phosphofructokinase) (PPi-PFK).
                                                                                                                                                                                                                                                                EMBL; AF336847; AAK28147.1;
                                                                                                                                                                                                                                                                                                                        entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7-phosphate synthase isoenzymes S699.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kuan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
STRAIN=S699;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Pseudonocardineae; Pseudonocardiaceae; Amycolatopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=33910;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Amycolatopsis mediterranei (Nocardia mediterranei).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Characterization and cloning
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PAITHWAY: Key control step of glycolysis. SUBUNIT: Homotetramer (By similarity).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  312
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          389
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      154 NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mueller M., August P.R., Pogosova-Agadjanyan E.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPBLGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LKAARLI-----SDNGLPIVGVPKTIDNDIAVTDVTFGFDTAVTVATEALDRLKTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |:| | ||:::|:|||: :::|=|:|
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TDIEMVSLADAVE 324
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LSIELEERLGKEARPV-ILGHVORGGTPTAYDRVLATRFGWHAVEAVHRGEFGKWTALRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FGEQFAQMIGAEKTI.VOKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EAEAKRIRE YMDKYDCVNIFY - SEGAGVEAIVAEMQAKGQEVPRDAFGHIKIDAVNPGKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       HQRVLIV-EVMGRHTGWIALHSGM-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HDEDNGNVLRAIE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DELTAKVGERFSAGKRFAIVVAAEGAKPKAGTMDFDEGG-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of three 3-deoxy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Amycolatopsis mediterranei
                                                                                                                                                                                                                                                                                                                                       (See http://www.isb-sib.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                D-arabincheptulosonate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           --arghveelgldaiipiggegt
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            6-phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -KDVYGHERFAGI - - ARQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -AAGAHAVVVPERPFDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Floss H.G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ရှ်
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      311
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           388
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               273
```

InterPro; IPRO00023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
PROSITE; PS00433; PHOSPHOFRUCTOKINASE; 1.
Kinase; Transferase; Glycolysis.

HAMAP; MF_00339; -;

-; 1.

SEQUENCE

A

3

2B5C28E7BBD57065

CRC64;

```
RESULT THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PRO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Dò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ø
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local Similarity
Matches 101; Conserv
                                                                                                                                                                                                                                                                                                                                              STRAIN=A2(2) / M145;

STRAIN=A2(2) / M145;

Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Challis G.L.,

Bentley S.D., Chater K.F., Cerdeno-Tarraga A.-M., Kieser H.,

Thomson N.R., James K.D., Harris D.B., Quail M.A., Kieser H.,

Thomson N.R., James K.D., Harris D.B., Quail M.A., Kieser H.,

Cronin A., Fraser A., Goble A., Hidalgo J., Hornsby T., Howarth S.,

Huang C.-H., Kieser T., Larke L., Murphy L., Oliver K., O'Neil S.,

Rabbinowitsch S., Rajandream M.A., Rutherford K., Rutter S.,

Seeger K., Saunders D., Sharp S., Squares R., Squares S., Taylor K.

Warren T., Wietzorrek A., Woodward J., Barrell B.G., Parkhill J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         K6P2 STF
Q9L1L8;
This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                               "Complete genome sequence coelicolor A3(2).";
Nature 417:141-147(2002).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PFKA2 OR PFK2 OR SC05426 OR SC6A11.02.
Streptomyces coelicolor.
Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation updat
6-phosphofructokinase 2 (EC 2.7.1.11) (Phos
(Phosphohexokinase 2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRCO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Streptomycineae; Streptomycetaceae; Streptomyces. NCBI_TaxID=1902;
                                                                                                    fructose 1,6-bisphosphate.

PATHWAY: Key control step of glycolysis.

SUBCELLULAR LOCATION: Cytoplasmic (By similarity)
SIMILARITY: Belongs to the phosphofructokinase fa
                                                                                                                                                                                                                        CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRCO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3
4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EAEAKRLREVMDKVDCVNIPVSBGAGVEAIVAEMQAKGQEV----PRDAFGHIKLDAVNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DEDNGNVLRAIEFPRIK 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTWLADEIAHRTGKESRAV-VLGHVQRGGTPTAYDRVLATRFGLNAVDAVADGDFGVM--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DQVVSWVERRFEKEFAPIIVVAEGALPEG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HHRALVV-EVMGRHAGWIALHS---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYBVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RVGVLTGGGDCPGLNAVTRAVVRKGIEVH-GWDFVGFRNGWNGPLTGDSRPL--GLNDVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            --- VALKGTDIVRVK 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12.0%;
                                                                                                                                                                                                                                                                                                              of,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60;
                                                                                                                                                                                                                                                                                                        the model actinomycete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 274.5; DB 1;
Pred. No. 1.5e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches 151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      update)
(Phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GEEKLLTGEKDAFGHVRLGGI--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -GLAGGA---SVILVPERHFNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                             family.
                                                                                                                                                                                                                                                                                                        Streptomyces
                                                                                                                                                                                                                           II
                                                                                                                                                                                                                              Ş.Ç.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        341;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  65
-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                93
```

```
RESULT
K6PF TH
ID K6
AC Q9
DT 166
DT 166
DT 166
DT 166
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO Ba
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
CO BA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ď,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   뫊
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
STRAIN=MSB8 / DSM 3109;

MEDELINE=99287316; PubMed=10360571;

Nelson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,

Haft D.H., Hickey E.K., Peterson J.D., Nelson W.C., Ketchum K.A.,

McDonald L., Utterback T.R., Malek J.A., Linher K.D., Garrett M.M.,

Stewart A.M., Cotton M.D., Pratt M.S., Phillips C.A., Richardson D.,

Heidelberg J., Sutton G.G., Fleischmann R.D., Eisen J.A., White O.,

Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.;

"Bvidence for lateral gene transfer between Archaea and Bacteria fra
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last seq
28-FEB-2003 (Rel. 41, Last ann)
6-phosphofructokinase (BC 2.7.
(Phosphohexokinase).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               THEMA
K6PF_1
                                                                                                                                                                                                                                                                                                                                                                                                                                    Thermotoga maritima.
Bacteria; Thermotogae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q9WY52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRINTS; PR00476; PHFRCTKINASE.

ProDom; PD000707; Ppfruckinase; 1.

PROSITE; PS00433; PHOSPHOFRUCTOKINASE; 1.

Kinase; Transferase; Glycolysis; Multigene family; Commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission of the commission o
                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.
                                                                                                                                                                                                                                                                                                                                                                                                      NCBI_TaxID=2336;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PFKA OR TM0209
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HAMAP: MF_00339; -; 1
InterPro; IPR000023;
Pfam; PF00365; PFK; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; AL939123; CAB
HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      use by non-profit institutions as long modified and this statement is not removed entities requires a license agreement (Secons send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   THEMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      214
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AL939123;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                GHIKLDAVNPGKWFGEQFAQMIGAE-KTLVQKSGYFARASASNVDDMRLIKSCADLAVEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NPRMLIVHEVMGRNCGWLTAATAQEYRKLEDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AHRGDFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AFRRESG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HORVMVV-EVMGRHAGWIAL-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LTAARML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GILAR-GGTILGSSRLERDRLREACEN---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RIGVLTAGGDCPGLNAVIRSVVHRAVD-NYGDEVIGFEDGYAGLL--DGRYRALDLNAVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GHERFQGIGTALAF--BLERRLGKEAKPVI--LGHVQRGGVPTAYDRVLATRFGWHAVEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADLVKMVEERFSRGKKFAVVC----VAEGAHPAEGSMDYGKGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EAEAKRIREVMDK----VDCVNIFVSEGA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAB72402.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -;
1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 11.9%; Score 271.5; 26.4%; Pred. No. 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ppfruckinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SDAGLPVVGVPKTIDNDISSTDRTFGFDTAVGVATEAMDRLKTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                        Thermotogales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             t sequence update)
t annotation updat
2.7.1.11) (Phosph
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                on update)
(Phosphofructokinase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 .4e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----GVEAIVAEMQAKGQEVPRDAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   멾
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Usage
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ESGMAAGA---HGICLPERPFDP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -AGDMIQNFGIDALIPIGGEGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                51
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ij.
                                                                                                                     .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                吕
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               15;
```

```
RESULT
KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
ID KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
IN KEPLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local S
Matches 95
                                                                                                                                                                                                                                                                                                                                                                               P16861;
01-AUG-1990
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 P16861;
01-AUG-1990 (Rel. 15, Created)
01-AUG-1990 (Rel. 15, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
6-phosphofructokinase alpha subunit (EC 2.7.1.11)
10-Amphohexokinase) (6PF-1-K alpha subunit).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TIGR; TM0209; -. 1.

HAMAP; ME 00339; -; 1.

InterPro; IPR000023; Ppfruckinase.

Pfam; PF00365; PPK; 1.

PRINTS; PR00476; PHFRCTKINASE.

ProDom; PD000707; Ppfruckinase; 1.

PROSTIE; PS00433; PHOSPHORRUCTOKINASE; 1.

RROSTIE; PS00433; PHOSPHORRUCTOKINASE; 1.

Kinase; Transferase; Glycolysis; Complete proteome.

Kinase; Transferase; Glycolysis; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                        Saccharomyces cerevisiae (Baker's yeast).
Eukaryota, Fungi, Ascomycota, Saccharomycosaccharomycetales, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Saccharomycetaceae, Sac
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YEAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    K6P1
        NCBI_TaxID=4932;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PIR; C72406; C72406.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EDIBL:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                YEAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 E
E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AE001705; AAD35301.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           YSQLADRICEERRRGKINSI-IIVAEGAASAYTVAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SHERAFIV-EYMGRHSGYIALMAG-----UVTGAE------AIIVPEIPVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ANPRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYBVHAVFVPEMAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLT----GAHLLYEEHKIPVVGIPATIONDIGLTDMCIGVDTCENTVMDAVQKLKDTAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKBGEDPQKVAADQEVKDGVDILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KIAVLTSGGDAPGMAAVRAVV-RY-GVRQGLEVIGVRGYSGLIDGDF--VKLEYKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LEAEAKRIREV--MDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKIDAVNPG 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGITEK-GGTILRTSRCEEFKT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                            STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -YRIGYE-TRITILGHVQRGGSPTAFDRRLALSMGVEAVDALLDGEVDVM
                                                                                Ascomycota; Saccharomycotina; Sacc; Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 253; DB 1;
Pred. No. 3.9e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              - EEGRELAAKQIKKHGIEGLVVIGGEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 319;
                                                                                                            Saccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                          (Phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14
```

```
Ş
                                                                                                                                                                                                                                                                                  В
                                                                                      뮹
                                                                                                                              3
                                                                                                                                                                                    Query Match
Best Local S
Matches 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             [2]
SEQUENCE FROM
STRAIN=S288c;
                                                                                                                                                                                                                                                                                                                          PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 2.
PROSITE; PS00433; PHOSPHOPRUCTOKINASE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; M26943; AAA34859.1; -.
EMBL; Z73025; CAAA77268.1; -.
EMBL; X87941; CAAA1193.1; -.
PIR; JQ0016; JQ0016.
HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a cobetween the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and foentities requires a license agreement (See http://www.isb-sib-entities requires a license agreement (See http://www.isb-sib-entities.com/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/seconds/se
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-96267763; PubMed-8701610; van der Aart Q.J.M., Kleine K., Steensma H.Y.; van der Aart Q.J.M., Kleine K., Steensma H.Y.; "Sequence analysis of the 43 kb CRM1-YLM9-PBT54-DIE2-SMI1-PH081-YHB4-PKN1 region from the right arm of Saccharomyces cerevisiae chromosome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Yeast
[3]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Guerreiro P., Azevedo D., Barreiros T., Rodrigues-Pous "Sequencing of a 9.9 kb segment on the right arm of ys VII reveals four open reading frames, including PFKI, for succinyl-CoA synthetase (beta-chain) and two ORFs homology with ORFs of the Yeast chromosome VIII."; Yeast 13:275-280(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
MEDLINE=89378757; PubMed=2528496;
Heinisch J.J., Ritzel R.G., von Be
Rodicio R., Zinmermann F.K.;
"The phosphofructokinase genes of
events.";
                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                               SGD; S0003472; PFK1.
GO; GO:0005945; C:6-phosphofructokinase
GO; GO:0005737; C:cytoplasm; IDA.
GO; GO:0005737; P:6-phosphofructokinase
InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         entities requires a license agreement (Some send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Yeast 12:385-390(1996).
-i- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=S288c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE OF 794-987 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ÷
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=97245298; PubMed=9090057;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SUBCELLULAR LOCATION: C
SIMILARITY: Belongs to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ENZYME REGULATION: Allosterically inhibited by ATP and by AMP and fructose 2,6-bisphosphate (By similarity). PATHWAY: Key control step of glycolysis. SUBUNIT: Heterocctamer of 4 alpha and 4 beta chains. SUBCLIJULAR LOCATION: Cytoplasmic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       subfamily.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          fructose 1,6-bisphosphate.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 78:309-321(1989).
257
                                                                                           204
                                           91
                                                                                                                                         W
H
                                                                                                                                                                                         103;
                                                                                                                                                                                                                                                                                                           Transferase;
                                                                                                                                                                                                             Similarity
                                                                                                                    KPKKVAILITAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FROM N.A.
                                           KKA-----GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDIL
                                                                                             KKKKIAVMTSGGDSPGMNAAVRAVVR--TGIHFGCDVFAVYEGYEGLLRGGKY-----LK
KMAWEDVRGWLSE-GGTLIGTA---
                                                                                                                                                                                    10.8%;
llarity 23.9%;
Conservative 6
                                                                                                                                                                                                                                                                               ΑA;
                                                                                                                                                                                                                                                                                  ; Glycolysis; Repeat; 107970 MW; 995B3DF7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 genes of yeast evolved from two duplication
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the phosphofructokinase family.
                                                                                                                                                                                    ; Score 246.5;
; Pred. No. 4.3e
68; Mismatches
                                                                                                                                                                                         68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Borstel R.C., Aguilera
                                                                                                                                                                                                                                                                                    995B3DF7C7781B29
                                                                                                                                                                                                                                                                                                                               2
                                                                                                                                                                                                             4.3e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rodrigues-Pousada
                                                                                                                                                                                                                                                                                                                                                                                                                                                    activity; IMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  complex;
                                                                                                                                                                                                                                                                                    Allosteric en:
C7781B29 CRC64
RSMEFRKREGRRQAAGNLISQGIDAL
                                                                                                                                                                                                                                    DB 1;
                                                                                                                                                                                         135;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ORFs sharing
                                                                                                                                                                                                                                    Length
                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               yeast
1, the
                                                                                                                                                                                                                                                                                                           enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     restricti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADP
                                                                                                                                                                                                                                         987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            gene coding
                                                                                                                                                                                         125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a collaboration - מינונקלאנוסח
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Two domains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        activated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 coding
                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       no
  303
                                                145
                                                                                             256
                                                                                                                                           90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         168
```

```
Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                da
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ď
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ď.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     K6P1 KIJLA STRAULALL,
Q032T5;
Q032T5;
01-OCT-1993 (Rel. 27, Created)
01-OCT-1993 (Rel. 27, Last sequence update)
15-SEP-2003 (Rel. 42, Last annotation update)
15-Dosphofructokinase alpha subunit (EC 2.7.111)
1) (Phosphohexokinase) (6PP-1-K alpha subunit).
                    PROSITE;
                                                                                                   EMBL; Z17315; CAA789
PIR; S32902; S32902.
HSSP; P00512; 3PFK.
                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collab between the Swiss Institute of Bioinformatics and the EMBL outset the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for commodified the statement is not removed. Usage by and for commodified the statement is not removed. Usage by and for commodified the statement is not removed.
                                                                                                                                                                                                                                                                                                                                                                                                                                    - i -
                                                                                                                                                               entities requires a license agreement (Some send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Fungi; !
Saccharomycetales;
                                                                     InterPro; IPR000023; Ppfruckinase
Pfam; PF00365; PFK; 2.
                                                                                                                                                                                                                                                                                                                                                                                                   +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Heinisch J.J., Kirchrath L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A., AND CHARACTER MEDLINE=93316853; PubMed=8326866;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Kluyveromyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Molecular genetics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KEUL
                                                                                                                                                                                                                                                                                                            by AMP and fructose 2,6-bisphosphate. PATHWAY: Key control step of glycolysis.
SUBUNIT: Heteroctamer of 4 alpha and 4 beta chains.
SUBCELLULAR LOCATION: Cytoplasmic (By similarity).
SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                              fructose 1,6-bisphosphate.
ENZYME REGULATION: Allosterically inhibited by
                                                                                                                                                                                                                                                                                                                                                                                                                             Microbiol. 8:559-570(1993).
CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate = ADP
                                                                                                                                                                                                                                                                                                    subfamily.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 513
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  304
PRO0476; PHERCTKINASE.
PD000707; Ppfruckinase; 2.
PS00433; PHOSPHOFRUCTOKINASE; 2.
Transferase; Glycolysis; Repeat;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AVLE----FTPBTPSPLIGILENKIIRMPLVESVKLTKSVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DKAISLRDTEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNGNVLRAIEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TLVQKSGYFARASASN------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LDDQLNFVTANDVKDALIEL---GLDTKVTILGHVQRGGTAVAHDRWLAT--LQGVDAVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRIREVMDKVDCV-----NIFVSEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DSTIGAYSALERICEMVDYIDATAKSHSRAFVV-EVMGRHCGWLALMAGIATGADY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VVCGGDGSLT-GADLFRHEWPSLVDELVAEGRFTKEEVAPYKNLSIVGLVGSIDNDMSGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HTIGGDDTNTAAADL-----AAFLARNNY------GLTVIGLPKTVDNDVFPI 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -----GVEAIVAEMQAKGQEVPRDAFCHIKL--DAVNPGKWFGEQFAQMIGAEK 345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KQSLGAWTAAEQGARYEMNVVAENNANPRMLIVHEVMGRNCGWLT----AATAQEYRKLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            lactis (Yeast).
ngi; Ascomycota; Saccharomycotina;
ales; Saccharomycetaceae; Kluyveror
                                                                                                                                  CAA78963.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hrath L., Liesen T., Vogelsang K., Hollenberg C.P., of phosphofructokinase in the yeast Kluyveromyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----IFIPERAVPHGKWQDELKEVCQRHRSKGRRNWTIIVAEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AND CHARACTERIZATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 899
                                                                                                                                                                                 (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kluyveromyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VDDMRLIKSCADLAVECAFRRESGVIGHDE 391
     Allosteric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Saccharomycetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                 ATP
                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                 Two
                                                                                                                                                                                                                                                                                                                                                                                                                                 +
                                                                                                                                                                                                                                                             a collaboration
                                                                                                                                                                                                                                                                                                                                                                                                   activated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -TAIENKOF
                                                                                                                                                                                                                                               outstation
                                                                                                                                                                                                                                                                                                                 domains
                                                                                                                                                                                                                                 엺
                                                                                                                                                                                                                457
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                243
```

```
KEPF CLOPE
ID KEPP ID KEPP ID KEPP ID KEPP ID REPARED ID COMMENT IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPERTY IN THE PROPER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          よ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ঠ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   $
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EW the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              28-FEB-2003 (Rel. 41, Created)
28-FEB-2003 (Rel. 41, Last sequence update)
28-FEB-2003 (Rel. 41, Last annotation update)
6-phosphofructokinase (BC 2.7.1.11) (Phosphofructokinase)
(Phosphohexokinase)
PFKA OR PFK OR CPE0361.
                                                                                                                                            fructose 1,6-bisphosphate.
-!- PATHMAY: Key control step of glycolysis.
-!- SUBCELIUTAR LOCATION: Cytoplasmic (By similarity).
-!- SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                              Shimizu T., Ohtani K., Hirakawa H., Ohshima
Shiba T., Ogasawara N., Hattori M., Kuhara S
"Complete genome sequence of Clostridium per
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clostridium perfringens.
Bacteria; Firmicutes; Clostridia;
Clostridium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  K6PF
                                                                                                                                                                                                                                                     Proc. Natl. Acad. Sci. U.S.A.
                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=13 / Type A;
MBDLINE=21664373; PubMed=11792842;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CLOPE
                                                                                                                                                                                                                                                                                                        flesh-eater.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q8XNH2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=1502;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28-FEB-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CLOPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              549
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           191
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               239
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LYSNEMSTTVNDDGSQLLPEADRLNIAIVHVGAP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DDQLNPITAE-OVKDVLVELGLDTKITTLGHVQRGGTAVAHDRWLAT--LQGVDAVKAIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LGANTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWL----TAATAQEYRKLLDRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         I-----KGGKPFNIDTDWFNSMLSBIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NMTPETPSPLIGILENKVIRMPLVES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 --GVEAIVAEMQAK-----GQEVPRDAFGHIKL--DAVNPGKWFGEQFAQMIGAEKTLV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EWIPELGLTRESYEVHAVFVPEMAI-----DLEAEAKRIREVMDKVDCVNIFVSEGA-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IGAYSALERICEMVDYIDATAKSHSRAFVV-EVMGRHCGWLGLMSGIATAADY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KDVRGWLSB-GGTLIGTAR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SKKKKLAVMTSGGDSQGMNAAVRAVVR---SSIYYGCDVYAVYEGYEGLVKGGDYLRKMEW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NKPKKVAILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----QKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IGGDGSLTGADLFRSBWPSLVBELVKDGKFTEDEVALYQNLTIVGMVGSIDNDMSGTDST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGED--PQKVAADQLVKDGVDILHT 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -----IFIPERAAPHGKWQDELKRVCQRHREKGRRNN--TVIVAEGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IGGDDTNTAA-----ADLAAFLARNN-----YGLTVIGLPKTVDNDVFPIKOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        992
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     109336 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          10.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    74;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 245.5; DB 1;
Pred. No. 5.1e-09;
                                                                                                                                                                                                                                                     D-fructose 6-phosphate =
                                                                                                                                                                                                                                                                                99:996-1001 (2002)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     724687F850F27F79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clostridiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----SKEFRERWGRKQACSNLEDQGIDALVV
                          ormatics and the EMBL outstati
There are no restrictions on
ong as its content is in no
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -VKLTKQVAAAIBAKDFDKAISLRDTEFIE
                                                                                                                                                                                                                                                                                                                                perfringens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B
                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                   K., Yamaba
S., Hayashi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            582
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    165;
                                                                                                                                                                                                                                                                                                                                                                                   Yamashita
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Clostridiaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                B H
                                                                                                                                                                                                                                                       ADP
                                                                                                                                                                                                                                                                                                                                anaerobic
                                                                                                                                                                                                                                                                                                                                                                                 Þ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 107;
                                                                                                      նյ
                                                                              collaboration -
                                                                                                                                                                                                                                                          Ģ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                404
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              493
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 436
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         190
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    68
```

```
밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                     5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SCHREDERE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local :
                                                                                                                                                                                                                                                 28-FEB-2003 (Rel. 41, Create
28-FEB-2003 (Rel. 42, Last s
15-SEP-2003 (Rel. 42, Last a
6-phosphofructokinase (EC 2.
(Phosphohexokinase).
                                                                                                                                                                                                                                                                                             QBKG19;
28-FEB-2003
28-FEB-2003
15-SEP-2003
                                        SPECIES=S.typhimurium, STRAIN=LT2 / SGSC1412 / ATCC 700720; MEDLINE=21534948; PubMed=11677609; MCClelland M., Sanderson K.E., Spieth J., Clifton S.W., Lat. Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulv. Ryan E., Sun H., Florea L., Miller W., Stoneking T., Mhan M. Waterston R., Wilson R.K.;
                                                                                                                                                                                                                         Salmonella typhimurium, 
Salmonella typhi.
                                                                                                                                                                                                                                                                                                                                                            K6PF
                                                                                                                                                                                                                                                                                                                                                                        SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRINTS; PR00476; PHFRCTKINASE.
PRODOM; PD000707; Ppfruckinase; 1.
PROSTIE; PS00433; PHOSPHORRUCTOKINASE; FALSE_NEG.
Kinase; Transferase; Glycolysis; Complete proteome.
Kinase; Transferase; Glycolysis; Complete proteome.
SEQUENCE 319 AA; 34066 MW; 95DE9CAFBAIlDF48 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HAMAP; MF_00339; -; 1.
InterPro; IPR000023; Ppfruckinase
Pfam; PF00365; PFK; 1.
                             "Complete genome sequence
                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                            Enterobacteriaceae; Salmonella.
                                                                                                                                                                                                          Bacteria; Proteobacteria; Gammaproteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AP003186; BAB80067.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch}.
                                                                                                                                                                          _TaxID=602,
                                                                                                                                                                                                                                                                                                                                                            SALTY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            248
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       3
    413:852-856(2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ŋ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                             FR-RESGVIGHDBDNGNVLRAIEFPRIKGGKPFNIDTD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INKLRDISTSHERVSIV-EVMGRNCGDLAL----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GSFMGAKLL-----SKLGVKTVGLPGTIDNDLSYTDYTIGFDTA-----LWTVVDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMVVVAE-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CHIO-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IIVPEMPFDKDBLIKTILEGRTNGKTHSI-IVVABGVGGSAELAKEIBSVTGIETRATIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VFVPEMAIDLEABAKRLRE--VMDKVDCVNIEVSEGAGVEAIVAE--MQAKGQEVPRDAF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSBIINRGGTILRTAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AGVLQRFGGSVIGNSRVKLTNVKDÇVKRGLVKEGEDPQKVAADQLVKD-GVDILHTIGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KKIAVLTSGGDAPGMNAALRAVTR--MALHHGLEVMGVQRGYAGLINGELFKMD---RKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KKVAILTAGGLAPCUNSAIGSLIERYTBIDPSIBIICYRGGYKGLLLGDSYPVTAEVRKK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ----nnanprmlivhevmgrncgwltaataqbyrklldrabwlpblgltresybvha
                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                              601;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               10.6%; Score 242; DB 1; 25.9%; Pred. No. 2.1e-09; tive 58; Mismatches 121
                                                                                                                                                                                                                                                                               Last sequence update)
Last annotation updat
(EC 2.7.1.11) (Phosph
                                                                                                                                                                                                                                                                                                                              Created)
                               of Salmonella
                                                                                                                                                                                                                                                      OR T3557.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CLE---FKQBEVRBKAA--QILKAYGVEALVVIGGD
                                                                                                                                                                                                                                                                                                                                                                                                                                    IKENRIFOMDID
                                                                                                                                                                                                                                                                                (Phosphofructokinase)
                                                                                                                                                                                                                                                                                                                                                          320
                                                                                                                                                                                                                                                                                                update)
                               enterica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DB 1; Length 319;
                                                                    Clifton S.W., Latreille P.,
M., Du F., Hou S., Layman D.,
Grewal N., Mulvaney B.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YAGIAGGAE --
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RGGSPTADDIVLASRMGAKAVEVL
                                                                                                                                                                                                          Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              416
                            serovar Typhimurium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels 116;
                                                          Whan M.,
                                                                                       Layman D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               188
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       92
```

```
8
                 Ş
                                                                                á
                                                                                                                                            S
                                                                                                                  밁
                                                                                                                                                                               닭
                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                  片
                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                   Query Match
Best Local .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collabora between the Swiss Institute of Bioinformatics and the EMBL outstati the Buropean Bioinformatics Institute. There are no restrictions on use by non-profit institutions as long as its content is in no modified and this statement is not removed. Usage by and for commer entitles requires a license agreement (See http://www.isb-sib.ch/annou or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SPECIES-S.typhi; STRAIM-CT18;
MADLINE-21534947; PubMed=11677608;
MADLINE-21534947; PubMed=11677608;
Parkhill J. Dougan G. James K.D., Thomson N.R., Pickard D., Wain Churcher C., Mungall K.L., Bentley S.D., Holden M.T.G., Sebaihia M., Eaker S., Basham D., Brooks K., Chillingworth T., Connerton P., Cronin A., Davis P., Davies R.M., Dowd L., White N., Farrar J., Feltwell T., Hamlin N., Haque A., Hien T.T., Holroyd S., Jagels K., Krogh A., Larsen T.S., Leather S., Moule S., O'Gaora P., Parry C., Quail M., Rutherford K., Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.;
"Complete genome sequence of a multiple drug resistant Salmonella enterica servorar Typhi CT18.";
                                                                                                                                                                                                                                                                                                                                                                               ProDom; PD000707; Ppfruckinase; 1.
PROSITE; PS00433; PHOSPHOFRUCTOKINASE;
Kinase; Transferase; Glycolysis; Comple
SEQUENCE 320 AA; 34915 MW; 68B0DDFC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AL627279; CAD09562.1;
EMBL; AE016846; AA071062.1;
StyGene; SG?????; pfkA.
HAMAP; MF_00339; -; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -:- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate = ADP fructose 1,6-bisphosphate.
-:- PATHWAY: Key control step of glycolysis.
-:- SUBCELLULAR LOCATION: Cytoplasmic (By similarity).
-:- SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              HAMAP; MF_00339; -; 1.
InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPECIES-S.typhi; STRAIN-TY2 / ATCC 700931; MEDLINE-22531367; PubMed-12644504; Deng W., Liou S.-R., Plunkett G. III, Mayh Burland V., Kodoyianni V., Schwartz D.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRINTS; PRO0476; PHFRCTKINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; AE008889; AAL22902.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    J. Bacteriol. 185:2330-2337(2003).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Comparative genomics and CT18.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Nature
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           [2]
SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                     266
                                                   155
                                                                                                                    101
                                                                                                                                                  148
                                                                                                                                                                                   61
                                                                                                                                                                                                                   88
                                                                                                                                                                                                                                                                                  Ü
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           413:848-852 (2001).
                                                                                                                                                                                                                                                                                                                                     Similarity
 VPEMAIDLEABAK--
                                               RDTSSSHQRISIV
                                                                                                                                                                                     MINR-----
                                                                        EVRKKAGVI.QRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHT
                                                                                                                                                                                                                                                  KKIGVLTSGGDAPGMAAIRGVVR--AALTEGLEVMGIYDGYLGLYEDRMVQLDRYSVSD
                                                                                                                                                                                                                                                                                    KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGL-----LLGDSYPVTA
                                                                                                                                                IGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNV
                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                  10.5%; Score 240.5;
24.8%; Pred. No. 2.7
                                                                                                                                                                                   -GGTFLGSAR--FPEFRD------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ġ,
                                                 Salmonella
                                                                                                                                                                                                                                                                                                                   59.
                                                                                                                    -TEMGFPCIGLPGTIONDIKGTDYTIGYFTALGTVVEAIDRL
                                                                                                                                                                                                                                                                                                                Pred. No. 2.7e-09;
9; Mismatches 122;
                                                                                                                                                                                                                                                                                                                                                                                   s; Complete proteome.
68B0DDFCF689F420 CRC64;
-RLREVMDKVDCVNIFVSEGAGVE---AIVAEMQAK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       I, Mayhew G.F., Rose D.J.,
D.C., Blattner F.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       enterica
                                                                                                                                                                                                                                                                                                                                                 DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         serovar
                                                                                                                                                                                   - ENIRAVAIENLKKRGIDALVV
                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Typhi strains
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ADP
                                                                                                                                                                                                                                                                                                                     129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         a collaboration

BL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       outstation
                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                     100
                                                                                                                                                                                                                    147
                                                                                                                                                                                                                                                    60
                                                    200
                                                                                      265
                                                                                                                     154
                                                                                                                                                   207
                                                                                                                                                                                                                                                                                    87
```

δ 밁 δ 먉

```
RESULT 13

KREPL ECOLI

ID KGEPL ECOLI

AC P06998;

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DT 28-FEB-2003

DE (phosphotexx

GN SECLISSEE.C

ROW MEDLINE=852

RA Hellinga H.I

RT "Nucleotide

RT SECHETICHIA

RT "Nucleotide

RT SECHETICHIA

RT "Nucleotide

RT SECHETICHIA

RT "Nucleotide

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Mutations

RT "Analysis o

RT "SECUENCE FR

RC SPECIES=E.C

RX MEDLINE=93

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA POSEAI G.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA ROSE D. J.

RA 
MEDLINE-21156231; PubMed=11258796; Marchawa K., Ishii K., Yokoyy Hayashi T., Makino K., Ohnishi M., Kurokawa K., Ishii K., Yokoyy Hayashi T., Ohtsubo E., Nakayama K., Murata T., Tanaka M., Tobe Iida T., Takami H., Honda T., Sasakawa C., Ogasawara N., Yasunac Kuhara S., Shiba T., Hattori M., Shanagawa H.; Tomplete genome sequence of enterohemorthagic Becherichia coli 0157:H7 and genomic comparison with a laboratory strain K-12.";
                                                                                                                                                                                               MEDLINE-21074935; PubMed=11206551;
Perna N.T., Plunkett G. III, Burland V., Mau B., Glasner J.D.,
Rose D.J., Mayhew G.F., Evans P.S., Gregor J., Kirkpatrick H.A.,
Posfai G., Hackett J., Klink S., Boutin A., Shao Y., Miller L.,
Grotbeck E.J., Davis N.W., Lim A., Dimalanta E.T., Potamousis K.,
Apodaca J., Anantharaman T.S., Lin J., Yen G., Schwartz D.C.,
Welch R.A., Blattner P.R.,
"Genome sequence of enterobaemorrhagic Escherichia coli O157:H7.",
Nature 409:529-533(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
SPECIES=B.coli; STRAIN=K12 / MG1655;
MEDLINE=93347969; PubMed=8346018;
Plumkett G. III, Burland V.D., Daniels D.I
"Analysis of the Escherichia coli genome.
"Egion from 87.2 to 89.2 minutes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hellinga H.W., Evans P.R.;
"Nucleotide sequence and high-level expression
Escherichia coli phosphofructokinase.";
Eur. J. Biochem. 149:363-373(1985).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     6-phosphofructokinase isozyme I (EC (Phosphohexokinase-1).
PFKA OR B3916 OR Z5460 OR ECS4841 OR
                                                                                                                                         SPECIES=E.coli; S:
                                                                                                                                                                                                                                                                                                                                                                                                                     Nucleic Acids Res. 21:3391-3398(1993)
[4]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                phosphofructokinase.";
Nature 327:437-439(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SPECIES=E.coli;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Enterobacteriaceae; Escherichia.
NCBI_TaxID=562, 83334, 623;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Escherichia coli 0157:H7,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 28-FEB-2003
15-SEP-2003
                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Hellinga H.W.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=87229041; PubMed=2953977;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=85203917; PubMed=3158524;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Shigella flexneri
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-APR-1988
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "Mutations in the active site of Escherichia coli
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -IDLLLEGHGGRCVGIQNEQLVHHD----IIDAIENMK----RPFK--SDW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CADLAVE----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GSPVPYD-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AND MUTAGENESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (Rel. 07,
(Rel. 41,
(Rel. 42,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ----DLVAEIKAGIAKGKKHAIVAITEHMCDVDELAHFIEKETGRETRATVLGHIQRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Evans
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STANDARD;
                                                                                                                                       STRAIN=0157:H7 / RIMD
                                                                                                                                                                                                                                                                                                                                                                              STRAIN=0157:H7 / EDL933 /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence well Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CAFRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Daniels D.L., br
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SF3994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              320
                                                                                                                                         0509952;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ã
                                                                                                                                                                                                                                                                                                                                                                              ATCC 700927;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Blattner F.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (Phosphofructokinase-1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ġ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              sequence
                                                            Yasunaga
                                                                               Yokoyama K.,
Tobe T.,
                                                              .
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    254
```

```
EMBL; X02519; CAA26356.1; -. EMBL; 119201; AAB03048.1; -. EMBL; AE000466; AAC76898.1; -. EMBL; AE005622; AAC59109.1; -. EMBL; AP002567; BAB38264.1; -. EMBL; AE015406; AAM45428.1; ALT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
CONFLICT
STRAND
TURN
HELIX
TURN
                                                                                                                                                                               ACT SITE MUTAGEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restrue by non-profit institutions as long as its content modified and this statement is not removed. Usage by and entities requires a license agreement (See http://www.isb-sorsend an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                           ECO2DBASS; F035.8; 6TH EDITION.
ECOGENE; EG10699; pfkA.
HAMAP; MF_00339; -; 1.
InterPro; TPR000023; Ppfruckinase
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Crystal structure of the complex of phosphofructokinase Escherichia coli with its reaction products.";
J. Mol. Biol. 204,973-994 (1988)
-I- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate = AD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Yu J.;

"Genome seguence of Shigella flexmeri 2a: insights into

through comparison with genomes of Escherichia coli K12

Nucleic Acids Res. 30:4432-4441(2002).
                                                                                                                                                                                                                                                                             PRIN'S; PRO0476; PHERCIKINASE.
PRODOM; PD000707; Ppfruckinase
PROSITE; PS00433; PHOSPHOFRUCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PIR; A86081; A86081.
PIR; A98234; A98234.
PIR; G65197; KIECFA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Shirakihara Y., Evans P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Jin Q., Yuan Z., Xu J., Wang Y., Shen Y., Lu W., Wang J., Liu I
Yang J., Yang F., Zhang X., Zhang J., Yang G., Wu H., Qu D., Do
Sun L., Xue Y., Zhao A., Gao Y., Zhu J., Kan B., Ding K., Chen
Cheng H., Yao Z., He B., Chen R., Ma D., Qiang B., Wen Y., Hou
                                                                                                                                                                                                                                           Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                 SWISS-2DPAGE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            MEDLINE=89125622;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SPECIES=E.coli;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                K-RAY CRYSTALLOGRAPHY (2.4 ANGSTROMS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SPECIES=S.flexneri; STRAIN=301 / S
MEDLINE=22272406; PubMed=12384590;
                                                                                                                                                                                                                                                              Cinase; Transferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: Belongs to the phosphofructokinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PATHWAY: Key control step of glyco
SUBUNIT: Homotetramer.
SUBCELLULAR LOCATION: Cytoplasmic.
MISCELLANBOUS: B.COLI HAS TWO 6-PH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            fructose 1,6-bisphosphate.

ENZYME REGULATION: SUBJECT TO ALLOSTERIC ACTIVATION BY ADP AND OTHER DIPHOSPHONUCLEOSIDES, AND INHIBITION BY PHOSPHOENOLPYRUV.
                                                                                                                                                                                                                                           proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8:11-22(2001).
                                                                            103
163
317
                                                                                                                                                                               128
128
172
                                                                                                                                                                                                                                                                                                                                                                                                                                                 £06998;
                                                                                                                                                                                                                                                                                   Ppfruckinase; 1.
PHOSPHOFRUCTOKINASE; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PubMed=2975709;
74
104
163
319
9
16
30
                                                                                                                                                                               128
128
172
                                                                                                                                                                                                                                                                Glycolysis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 COLI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ₽
                                                                                                                                        NUCLEOPHILE (POTENTIAL).
D->S: REDUCES CATALYTIC R
R->S: REDUCES TURNOVER NU
3.4.
F -> C (IN REF. 1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALT_INIT.
                                                                               R - - P
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               TWO 6-PHOSPHOFRUCTOKINASES ENZYMES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      / Serotype
                                                                                                                                                                                                                                                                3D-structure; Allosteric
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        glycolysis.
                                                                                                  ٣
                                                                                                                     ន
                                                                            DG (IN REF. 1).
(IN REF. 1).
EKM (IN REF. 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INHIBITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          There are no restrictions 
ong as its content is in 
yved. Usage by and for con 
(See http://www.isb-sib.ch/ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2a;
                                                                                                                                                                                   TURNOVER NUMBERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                BY PHOSPHOENOLPYRUVATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         family.
                                                                                                                                                                                                  RATE 18000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              pathogenicity and 0157.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL outstation
                                                                                                                                                                                                                                                                enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Chen S.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Liu H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  a collaboration -
                                                                                                                                                                                 BY ABOUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
```

STRAND HELIX TURN

STRAND TURN HELIX TURN

TURN
STRAND
TURN
HELIX
TURN
STRAND
HELIX
STRAND
HELIX
HELIX
HELIX
HELIX
HELIX
TURN
STRAND
TURN

185 193 193

STRAND HELIX

SEQUENCE

320

A.

34842 MW;

D03D79F6A5536A41 CRC64;

Length

Similarity

HELIX

밁

```
Gaps
                                                                                                                                                                                                                               265
                                                                                                                         261
                                                                                                                                                                                                                                                                  154
                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                          RESULT
K6PF_YE
                S
                                                                      Query Match
Best Local :
                                                      Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      28-FEB-2003
28-FEB-2003
28-FEB-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN=CO-92 / Biovar Orientalis;

MEDLINE=21470413; PubMed=11586360;

Parkhill J., Wren B.W., Thomson N.R., Titball R.W., Holden M.T.G.,

Prentice M.B., Sebaihia M., James K.D., Churcher C., Mungall K.L.,

Baker S., Basham D., Bentley S.D., Brooks K., Cerdeno-Tarraga A.M.,

Chillingworth T., Cronin A., Davies R.M., Davis P., Dougan G.,

Feltwell T., Hamlin N., Holroyd S., Jagels K., Karlyshev A.V.,

Feltwell T., Hamlin N., Holroyd S., Jagels K., Karlyshev A.V.,

Feltmenter S., Moule S., Oyston P.C.F., Quall M., Rutherford K.,

Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.,

"Genome sequence of Yersinia pestis, the causative agent of plague.

Nature 413:523-527(2001).
                                                                                                                       HAMAP; MF 00339; -; 1.
InterPro; TPR00023; Ppfruckinase.
Pfam; PP00365; PPK; 1.
PRINTS; PR00476; PHFRCTKINASE.
PRODOM; PD000707; Ppfruckinase; 1.
PROSOM; PD000707; Ppfruckinase; 1.
PROSTTE; P800433; PHOSPHOFRUCTOKINASE; 1.
Kinase; Transferase; Glycolysis; Complete proteome.
Kinase; Transferase; Glycolysis; Complete proteome.
Kinase; Transferase; Glycolysis; 1D5483BABD0E430D CRC64;
                                                                                                                                                                                                                                                                                                                                                                   This SWISS-PROT entry is copyright. It is produced through a collaborative between the Swiss Institute of Bioinformatics and the EMBL outstation the Buropean Bioinformatics Institute. There are no restrictions on it use by non-profit institutions as long as its content is in no we modified and this statement is not removed. Usage by and for commercia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        K6PF_YERPE
Q8ZJI6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "Genome sequence of Yersinia pestis KIM.";
J. Bacteriol. 184:4601-4611(2002).
-!- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Straley S.C., McDonough K.A., Nilles M.L., Matson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE=22137863; PubMed=12142430;
Deng W., Burland V., Plunkett G. III, Boutin A., May
Perna N.T., Rose D.J., Mau B., Zhou S., Schwartz D.C.
Fetherston J.D., Lindler L.B., Brubaker R.R., Plano
Fetherston J.D., Lindler L.B., Brubaker R.R., Plano
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CTPAIN=KIM5 / Biovar Mediaevalis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28-FEB-2003 (Rel. 41, Last seq
28-FEB-2003 (Rel. 41, Last ann
6-phosphoftructokinase (EC 2.7.
(Phosphohexokinase).
                                                                                                                                                                                                                                                                                 EMBL; AJ414141; CAC88944.1; -.
EMBL; AE013607; AAM83654.1; -.
                                                                                                                                                                                                                                                                                                                                       or send
                                                                                                                                                                                                                                                                                                                                                      entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        fructose 1,6-bisphosphate.
-!- PATHWAY: Key control step of glycolysis.
-!- SUBCELULAR LOCATION: Cytoplasmic (By similarity).
-!- SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales;
                                                                                                                                                                                                                                                                  PIR; AF0010; AF0010
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Perry R.D.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Yersinia pestis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PFKA OR YPO0078 OR Y0059
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               284 CVGIQNEQLVHHD-----IIDAIENMK----RPFK--GDWLD 314
                    ű
                                                                                                                                                                                                                                                                                                                                       an email to license@isb-sib.ch).
                                                                        Similarity
KKVAILTAGGLAPCLNSAIGSLIERYTBIDPSIEIICYRGGYKGLLLG----DSYPVTA
                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 41, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Yersinia.
                                                                      10.3%;
                                                      50;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    sequence update)
annotation update)
2.7.1.11) (Phosphofructokinase)
                                                                      Score 234.5; DB 1
Pred. No. 7.1e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                       Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                       DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mayhew G.
                                                                                         Length
                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       G.V.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Blattner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                of plague.";
                                                                                                                                                                                                                                                                                                                                                                                                                             a collaboration -
                                                         73;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ņ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Liss
                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ö
```

```
S
                                                밁
                                                                             Š
                                                                                                               В
                                                                                                                                               Ş
                                                                                                                                                                                   밁
                                                                                                                                                                                                             Ş
                                                                                                                                                                                                                                                      띩
                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                       멼
                                                                                                                                                                                                                                                                                                                                                     á
                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local S
Matches 100
                378
                                                  262
                                                                                  318
                                                                                                                                                                                     25,
                                                                                                                                                                                                                      208
                                                                                                                                                                                                                                                        101
                                                                                                                                                                                                                                                                                      148
148
                                                                                                                                                                                                                                                                                                                                                                                                                                                              100;
                                                                                                                                                                                                                                                                                                                         61
                                                                                                                                                                                                                                                                                                                                                         88
                                                                                                                                                                                                                                                                                                                                                                                                                          ü
                                                                                                                                                                                                                                                                                                                                                                                         w
MINR-----
                                                                                AFGHIKLDAVNPGKWFGEQFAQMIGAEKTIVQKSGYFARASASNVDDMRLIKSCADLAVE 377
                                                                                                                 VNEIKAGI-AKGKKHAIVAITEHMCDVDELAHFIEKETGRETRATVLGHIQRGGSPVPYD
                                                                                                                                                                                  RDTSSSHQRISVV-EVMGRYCGDLTLAAA-----IAGGCEFVVVPEVEFSRED------L 202
                                                                                                                                                                                                                  VAENNANPRMLIVHEVMGRNCGWLTAATAQBYRKLLDRAEW--LPELGLTRESYBVHAVF
                                                                                                                                                                                                                                                                                     IGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNV 207
                                                                                                                                                                                                                                                                                                                                                     EVRKKAGVIQREGGSVIGNSRVKIINVKDCVKRGIVKEGEDPQKVAADQLVKDGVDILHT
                                                                                                                                                                                                                                                                                                                                                                                         KKIGVLTSGGDAPGMNAAIRGVVR--SALTEGLEVMGIYDGYLGLYEDRMVQLDRYSVSD
                                                                                                                                                                                                                                                                                                                                                                                                                        KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGL-----LLGDSYPVTA
                                                                                                                                                 VPEMAIDLEAEAKR-----LREVMDKVDCVNIFVSBGAGVB---AIVABMQAKGQEVPRD
                                                                                                                                                                                                                                                        IGGDGSYMGAMRL-----TEMGFPCIGLPGTIDNDIKGTDYTIGFFTALSTVVEAIDRL
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                         -ĠĠTFLĠSAR--FPEFRD------ENIRAVAIENLKKRGIDALVV 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                          10.4%; Score 238.5; DB 1; 24.9%; Pred. No. 3.7e-09; tive 65; Mismatches 132;
                                                --LASRMGAYAIDLLLAGYGGR-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels
                 419
                                                                                                                                                                                                                                                                                                                                                                                                                                                              105;
```

```
RESULT 15

K66PF BACNC
ID K66PF BACNC
ID K66PF BACNC
ID K66PF BACNC
ID K66PF BACNC
ID K66PF BACNC
ID K66PF BACNC
ID 15-JULL
DT 15-JULL
DT 28-FEB
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB (Phosp
DB ACCLI
IN 11
DC Bacter
OC Bacter
IN COLIT
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (II)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)
RN (III)

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   K6PF_BACMC STANDARD; PRT; 322 AA G59214; G59214; 15-JUL-1998 (Rel. 36, Created) 15-JUL-1998 (Rel. 36, Last sequence update) 15-JUL-1998 (Rel. 41, Last amotation update) 6-phosphofructokinase (EC 2.7.1.11) (Phospholexokinase). PEKA OR PEK.
                                                                                           PRINTS; PR00476; PHERCTKINASE.
PRODOUT; PD000707; PDETUCKINASE;
PROSITE; PS00433; PHOSPHOFRICTOKINASE;
Kinase; Transferase; Glycolyeis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on it use by non-profit institutions as long as its content is in no was modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -:- SUBUNIT: Homotetramer (By similarity).
-!- SUBCELLULAR LOCATION: Cytoplasmic (By similarity).
-!- SIMILARITY: Belongs to the phosphofructokinase family.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=96257193; PubMed=8675031;
Rouwendal G.J.A., Zwiers L.H., Wolbert E.J.H., Springer Mooibroek H., Huizing H.J.;
                                                                   SEQUENCE
                                                                                                                                                                                                                           HSSP; P00512; 3PFK.
HAMAP; MF_00339; -; 1.
InterPro; IPR000023; E
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                    EMBL; X76484; CAA54022.1; -. PIR; S39248; S39248.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fructose 1,6-bisphosphate.
-1- PATHWAY: Key control step of glycolysis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      encoding phosphofructokinase Gene 171:59-63(1996).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacillus macquariensis.
Bacteria, Firmicutes, B
                                                                                                                                                                                                                                                                                                                                                                                                                                                      or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- CATALYTIC ACTIVITY: ATP + D-fructose 6-phosphate = ADP + D-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Cloning, sequence and expression in Escherichia coli of the gene neoding phosphofructokinase from Bacillus macquariensis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-ATCC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NCBI_TaxID=1468;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                254 RGGAPVAYD 262
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             309 AKGQEVPRD 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   154 RIRDTSSSHORISIV-EVMGRYCGDLTLAAA----IAGGCEFIAIPEVEFKRD-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             146 HTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFM 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99 VVIGGDG-SYACADLET----KEGGIHCVGLPGTIDNDVAGTDYTIGFFTALETVVEAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 MINR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEW--LPELGLTRESYEVHA 263
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EVRKKAGVLQRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQ--KVAADQLVKDGVDIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KKIGVLTSGGDAPGMNAAIRGVVR--AALSAGLDVFGIEDGYLGLYENRMKXLDRYSVSD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ----DLVAEIKAGIAKGKKHAIVAITEKLDDIDSLAKYIEKETGRETRGTVLGHIQ 253
                                                                   34648 MW;
                                                                                                                                                                                                                                                      Ppfruckinase.
      10.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bacillales;
      Score 233.5;
                                                                2C156F42669EC46C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Paenibacillaceae; Paenibacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      on update)
(Phosphofructokinase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----FPBFRDPSVRKVALKUMHERGIDGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A
   DB 1;
Length 322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <u>د</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a collaboration -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                commercia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             145
```

```
맗
                          S
                                                         ₽
                                                                                   Ś
                                                                                                                     뭆
                                                                                                                                              S
                                                                                                                                                                               밁
                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                  á
                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                   Best Local Similarity
 287
                             385
                                                         235
                                                                                      331
                                                                                                                     200
                                                                                                                                                273
                                                                                                                                                                               161
                                                                                                                                                                                                           213
                                                                                                                                                                                                                                         107
                                                                                                                                                                                                                                                                     153
                                                                                                                                                                                                                                                                                                   60
                                                                                                                                                                                                                                                                                                                                                                                                                    101;
                                                                                                                                                                                                                                                                                                                            93 AGVLORFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPOKVAADQLVKDGVDILHTIGGDD 152
                                                                                                                                                                                                                                                                                                                                                                                        33 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK
CGII----SNELVLTDID-KVVNSKKEFNMELYELAARLSQ 322
                                                                                                                                                LEABAKRIRE - - VMDKVDCVNI FYSEGAGVEAI VAEMQAKGQEVPRDAFGHI KIDAVNPG
                                                                                                                                                                                                                                       SYHGANKL -----SKLGINTMALPGTIDNDISYTDFTIGFDTSVSIVVDAINKLRDTMS
                                                                                                                                                                                                                                                                                              GDIIQR-GGTVLQSAR------CKBFMTPEG---QQKGADILRKRGIDGLVVIGGDG
                                                                                                                                                                                                                                                                                                                                                     KWFGEQFAQMIGAEKTL---VQKSGYFARASASNVDDMRLIKSCADLAVECAFRRES---
                                                                                                                                                                             SHERSSIV-EVMCRHCGDIAL----YAGLASGAB------TIIVPEVPFD
                                                                                                                                                                                                          ANPRMLI VHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPEMAID
                                                                                                                                                                                                                                                                    TNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYFMNVVAENN
                             -GVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSE 424
                                                                                                                  MDEIAERMKQNFAHGKRHSI-VVVAEGAG------NGENVAK--
                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
                                                         QLVERCETLEPRVTVLGHIQRGGTPTPADRNLASRLGDFAVRMLIAGESAKA
                                                                                                                                                                                                                                                                                                                                                                                                                                25.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                  68;
                                                                                                                                                                                                                                                                                                                                                                                                                  Pred. No. 8.1e-09;
8; Mismatches 141;
                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                    91;
                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                      160
                                                           286
                                                                                       384
                                                                                                                                                330
                                                                                                                                                                                                                                                                                                                                                                                        92
                                                                                                                                                                             199
                                                                                                                                                                                                           272
                                                                                                                                                                                                                                                                    212
                                                                                                                                                                                                                                                                                                 106
                                                                                                                                                                                                                                                                                                                                                          59
                                                                                                                     234
                                                                                                                                                                                                                                                                                                                                                                                                                    17
```

Search completed: January 29, 2004, 14:37:01 Job time: 18 secs

 $\mathfrak{E}_{(-)}$

```
Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                     Minimum DB seq length: 0
Maximum DB seq length: 2000000000
                                                                                                                                                                                                                                                                                                                                                           Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     OM protein - protein search, using sw model
                                                                                                                                                                                                                                       Database :
                                                                                                                                                                                                                                                                                                                                                                                           Searched:
                                                                                                                                                                                                                                                                                                                                                                                                                                Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Run on:
                                                                                                                                                                              SPTREMBL 23:*

1: sp_archea:*
2: sp_bacteria:*
3: sp_fungi:*
4: sp_human:*
 BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               January 29, 2004, 14:30:22; Search time 40 Seconds (without alignments) 2819.225 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                        830525 seqs, 258052604 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-09-941-947A-2
2284
                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 DVVTWPYHLTADIRFCHWFF.....FNSMLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 5.1.6
Copyright (c) 1993 - 2004 Compugen Ltd.
                                                   sp_organelle:*
sp_phage:*
sp_plant:*
sp_rodent:*
sp_virus:*
sp_virus:*
sp_unclassified:*
sp_rvirus:*
sp_bacteriap:*
sp_archeap:*
                                                                                                                                      sp_invertebrate:*
sp_mamma1:*
sp_mhc:*
                                                                                                                                                                            sp_human: *
                                                                                                                                                                                                                                                                                                                                                               830525
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

	16	15	14	13	12	11	10	y	8	7	σ'n	5	4	LJ	2		No.	Result	
	253	257.5	260	260.5	263.5	263.5	266	270	274.5	278	281.5	282	305	1292.5	1302	1453	Score		
	11.1	11.3	11.4	11.4	11.5	11.5	11.6	11.8	12.0	12.2	12.3	12.3	13.4	56.6	57.0	63.6	Match Length	Query	оAР
	473	500	382	775	586	436	489	448	341	366	485	488	346	514	404	410			
	5	10	m	10	10	(m	10	16	N	16	10	10	N	0 اما	ρ Η	(J)	88		
1	081714	Q9STQ7	Q24812	Q9LG72	Q94JI2	Q27651	Q94AA4	051669	Q9AGC0	Q8XL57	Q9C5J7	Q9FJU5	Q9KH71	QHUDLO	Q92NK9	Q9NGP6	ID		
,	Q81714 arabidopsis	Q9stq7 arabidopsis	Q24812 entamoeba h	Q91g72 oryza sativ	Q94ji2 oryza sativ	Q27651 entamoeba h	Q94aa4 arabidopsis	O51669 borrelia bu	Q9agc0 amycolatops		Q9c5j7 arabidopsis	Q9fju5 arabidopsis	Q9kh71 dictyoglomu	Q8udl0 agrobacteri	Q92nk9 rhizobium m	Q9ngp6 mastigamoeb	Description		

4. 5	4	43	42	41	40	39	38	37	36	S	34	IJ U	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
212	212.5	212.5	213.5	216	217.5	217.5	218	220	221	221	222.5	223.5	226.5	232	234	235	239	240	240.5	243	244.5	245	245	248.5	250	251	252	252
9.3	9.3	9.3	•	9.5			9.5	9.6	9.7	9.7	9.7	9.8	9.9	10.2	10.2	•	10.5	10.5	10.5	10.6	10.7	10.7	10.7	10.9	10.9	11.0	11.0	11.0
784	549	337	775	784	537	320	750	573	490	335	361	921	444	461	530	390	462	337	352	462	486	431	324	437	426	473	487	459
11	N	6	w	11	10	16	4	16	UΊ	16	N	თ	0	16	ij	16	10	ы	95	10	ហ	16	N	σı	υī	10	Ç	K
Q8C516	Q9FAF8	Q8DTX6	Q9HGZ0	080605	Q8VYN6	Q8DCY1	Q96I60	083553	Q8WPP2	№ ₽ № 5	Q9S479	QBSSA3	Q9FIK0	083146	Q9FKG3	QBKFS2	Q8LA55	057694	QBFBD0	Q9M076	Q9BIC6	Q8EXU6	Q8GNC1	Q27705	061068	Q9M0F9	015648	600080
Q8c5i6 mus musculu	Q9faf8 porphyromon	Q8dtx6 streptococc	Q9hgz0 aspergillus	Q8c605 mus musculu	Q8vyn6 arabidopsis	Q8dcyl vibrio vuln	Q96i60 homo sapien	O83553 treponema p	Q8wpp2 trypanoplas	Q8dq85 streptococc	Q9s479 тухососсив				Q9fkg3 arabidopsis	Q8kfs2 chlorobium	Q8la55 arabidopsis	O57694 thermoprote	Q8fbd0 escherichia	Q9m076 arabidopsis	Q9bic6 leishmania	Q8exu6 leptospira	Q8gnc1 haemophilus	Q27705 naegleria f	O61068 trichomonas	Q9m0f9 arabidopsis	O15648 trypanosoma	увупия атусстаторя

ALIGNMENTS

84 84 84 84 84 84 84 84 84 84 84 84 84 8	PRESENT OF SOLUTION OF SOLUTIO	1
33 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTA	NGP6 QSNGP6 PRELIMINARY; PRT; 410 AA. QSNGP6; QSNGP	•
	** ***	

```
RESULT
Q9 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
ID 2NG9
     B
                                                                                                            밁
                                                                                                                                                                                                                       В
                                                                                                                                                                                                                                                                    ô
                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                            Б
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            뮍
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local S
Matches 246
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Capela D., Barloy, Hubler F., Goury J., Bothe G., Ampe F., Batut J., Botistard P., Becker A., Boutry M., Cadieu E., Dreano S., Gloux S., Godrie T., Goffeau A., Kahn D., Kiss E., Lelaure V., Massy D., Pohl T., Portetelle D., Puchler A., Purnelle B., Ramsperger U., Renard C., Thebault P., Vandenbol M., Weidner S., Galibert F., "Analysis of the chromosome sequence of the legume symbiont Sinorhizobium mellioti strain 1021.", Proc. Natl. Acad. Sci. U.S.A. 98:9877-9882(2001).

EMBL; AL591789; CAC45769.1; -. IRMDL; AL591789; CAC45769.1; -. IRMDL; AL591789; PFKJ. ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-MAR-2003 (TrEMBLrel. 23, Last annotation update)
Probable pyrophosphate--fructose 6-phosphate 1-phosphotransferase
protein (EC 2.7.1.90).
PFK OR R02190 OR SMC01852.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRINTS; PRO0476; PHFRCTKINASE.
PRODOM; PD000707; Ppfruckinase; 1.
Transferase; Complete proteome.
SEQUENCE 404 AA; 43712 MW; 1F6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Rhizobium meliloti (Sinorhizobium meliloti).
Bacteria, Proteobacteria, Alphaproteobacteria, Rhizobiales,
Rhizobiaceae, Sinorhizobium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN=1021;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=382;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q92NK9;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Q92NK9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=21396507; PubMed=11481430;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N
     184
                                                         213
                                                                                                               124
                                                                                                                                                                   153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              393
                                                                                                                                                                                                                                                                                                                                                                                                                                     246;
                                                                                                                                                                                                                       64
                                                                                                                                                                                                                                                                          93
                                                                                                                                                                                                                                                                                                                                                                                 (L)
(L)
                                                                                                                                                                                                                                                                                                                              4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Similarity
                                                                                                                                         TNTAAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKÇSIGAWTAAEQGARYFMNVVAENN 212
                                                                                                                                                                                                                    AHVLHREGGSPIGNSRVKLTNTADCVKRGLVKEGENPLRVAAERLASDGISILHTIGGDD
                                                                                                                                                                                                                                                   AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                            KKVAILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK
AAPRTLVVHEVMGRHCGWLTAATARAYIHLAGNKEYVDGFMMAQLKNIDGLYLPEMAPD
                                                   AMPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAID
                                                                                                                                                                                                                                                                                                                           KKVAMLTAGGLAPCESSAVGGLIERYTDIAPDYELVAYRSGYQGLILLADRIEITPAMREK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGQPKGGKVEVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LEAEAKKLKEVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNFGKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RNGVLRAIEFERVKGAKAFNIDHPWFTHLLNEIGOPKGAKVSVAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FGKQFGGMVGADKVLVQKSGYFSRSAPANAEDLRLIKGMVDLAVDCALRGEAGLIGHDEE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LKABAARLRAVMERVGCVNIFLSBGAGINDIVAEMTAKGETVPRDPFGHVKIDLINPGAW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ANDRYLLVHEVMGRSCGYLTAQAADYYRAQLAHRBFAPELGHTRERYDIHAVYVPEMTID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVDEMAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               57.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                     59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 1302;
Pred. No. 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1F6E5CD966AA13D5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    404
                                                                                                                                                                                                                                                                                                                                                                                                                                                               4.2e-88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                  90;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length
                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        407
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         404;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Batut J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                  0
                                                                                                          FDHVSNEQS
                                                      272
                                                                                                                                                                                                                 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                392
                                                                                                          183
                                                                                                                                                                                                                                                                       152
                                                                                                                                                                                                                                                                                                                           63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    272
                                                                                                                                                                                                                                                                                                                                                                                                                                  0
```

S

₽ S

68

SIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLV HLHAAVASICQTCLWVYAK---RRANMAKQXVAMLTAGGLAPCLSSAVGGLIERYSDIAP HLTADI----RPCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDP

123 145 8

á

S

```
RESULT OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF SERVICE OF S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    よ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    S
                                          Query Match
Best Local 9
                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A.

MEDLINE=21608550; PubMed=11743193;

MOOD D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P.,

Mood D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P.,

Mood D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P.,

Mood D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P.,

Mood D.W., Setubal J.C., Kaul R., Monks D.E., Jr., Woo L.,

Chen Y., Paulsen I.T., Eisen J.A., Karp P.D., Bovee D. Sr.,

Chapman P., Clendenning J., Deatherage G., Gillet W., Grant C.,

Kutyavin T., Levy R., Li M.-U., McClelland E., Palnieri A.,

Kutyavin T., Levy R., Li M.-U., McClelland E., Palnieri A.,

Raymond C., Rouse G., Saenphimmachak C., Wu Z., Romero P., Gordon D.

Raymond C., Rouse G., Saenphimmachak C., Wu Z., Romero P., Gordon D.

Raymond S., Yoo H., Tao Y., Biddle P., Jung M., Krespan W., Perry M.,

Gordon-Kamm B., Liao L., Kim S., Hendrick C., Zhao Z.-Y., Dolan M.,

Chumley F., Tingey S.V., Tomb J.-F., Gordon M.P., Olson M.V.,

Mester E.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Goodner B., Hinkle G., Gattung S., Miller N., Blanchard M., Qurollo B., Goldman B.S., Cao Y., Askenazi M., Halling C., Mullin L., Houmiel K., Gordon J., Vaudin M., Iartchouk O., Epp A., Liu F., Wollam C., Allinger M., Doughty D., Scott C., Lappas C., Markelz B., Flanagan C., Crowell C., Gurson J., Lomo C., Sear C., Strub G., Cielo C., Slater S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-JUN-2002 (TrEMBLrel. 21, Created)
01-JUN-2002 (TrEMBLrel. 21, Last sequence update)
01-MAR-2003 (TrEMBLrel. 23, Last annotation update)
Pyrophosphate--fructose-6-phosphate 1-phosphotransferase.
PFP OR ATUZ115 OR AGR C_3836.
Agrobacterium tumefaciens (strain C58 / ATCC 33970).
                                                                                                                                      Transferase; Complete proteome.
SEQUENCE 514 AA; 55841 MW; B92DF77E39F0E0AD CRC64;
                                                                                                                                                                                                  PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OSUDLO
OSUDLO
                                                                                                                                                                                                                                                                            InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                        EMBL; AB009161; AAL43105.1; ALT_INIT EMBL; AB008127; AAK87863.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A. MEDLINE=21608551; PubMed=11743194;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "The genome of the natural genetic engineer Agrobacterium tumefaciens
                                                                                                                                                                                                                                                                                                                                                                                                           Agrobacterium tumefaciens C5
Science 294:2323-2328(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                           "Genome sequence of the plant pathogen and Agrobacterium tumefaciens C58.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Science 294:2317-2323 (2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C58. "
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=176299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bacteria; Proteobacteria; Alphaproteobacteria; Rhizobiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rhizobiaceae;
                                   Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             w
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  273
              246;
                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGQ 427
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FSKQFAALIGAERSMVQKSGYYARSAPANVDDLRLIQSMVDLAVESALNKVSGVTGHDED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             QGGRLRTIEFFRIKGGKHFDTSAKWFGEVMDVVGQ 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FGEQFAQMIGAEKTLYQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED 392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LEAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKW 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LEAEAARLREVMDRAGFVTLFVSEGACLDAIVAEREAAGETVKRDAFGHVKIDTINVGNW
              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Rhizobium.
                                      56.68;
71;
          Score 1292.5;
Pred. No. 3.1e-
71; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 514
                                          5; DB 16;
.1e-87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           biotechnology agent
          101;
                 Indels
                                                                          Length 514;
          7
          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   363
          2
```

13

```
9
                                                  몽
                                                                  S
                                                                                             밁
                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ŕ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뫄
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                              Query Match
Best Local S
Matches 107
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Q9KH71;
01-OCT-2000
01-OCT-2000
01-JUN-2002
                                                                                                                                                                                                                                                                                         Ding Y.-H.R., Ronimus R.S., Morgan H.W.;
"Sequencing, cloning, and high-level expression of the pfp gene,
encoding a ppi-dependent phosphofructokinase from the extremely
thermophilic eubacterium Dictyoglomus thermophilum.";
J. Bacteriol. 182:4661-4666(2000).
                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
STRAIN-Rt46 B.1;
MEDLINE-20372656; PubMed=10913106;
                                                                                                                                                                                                                                           EXMBJ, AF268276; AAF80100.1; -.
HSSP; D06998; 2PFK.
InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                 PRINTS; PR00476; PHERCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                              Dictyoglomus thermophilum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Q9KH71
                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       4
   108
                         154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            446
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    364
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         146
                                                                        94
                                                                                                                   34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                ψı
                                                                                                                                                                                                                                                                                                                                                                                                                a; Dictyoglomi; Dictyoglomales; Dictyoglomaceae; Dictyoglomus.
                                                                                                                                                          Similarity
                       NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA
  LGVASKF---
                                                                     GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKBGBDFQKVAADQLVKDGVDILHTIGGDDT
                                                                                             RIGVLTGGGDCPGLNPAIRGIVMR--ALDYGDEVIGLKYGWAGLLKADTMPLSLEMVED-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIBFPRIKGGKPFNIDTDWFNSMLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HVGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EIGQP 428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RGNDYVEGLMMNTOMKNIDGIYLPEMAFDIEAEAERLKEVMDKHGYVTLFVSEGAGLDAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DRÆEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGVEAI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DLRLIQGWVDLAVESALNKVSGVTGHDEDQNGKLRTIEFPRIKGGKHFDLSAKWFTEVME 505
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VAEREAAGEAVKRDAFGHVKIDTINVGGWFQKQFAGLIGAERSMVQKSGYFARSAPANGD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VFPIKQSLGAWTAAEQGARYEMNYVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VVPIKQSIGAWTAABVGAAFFDNVSNEQSAAPKTFVIHEVMGRHCGWLTAATARAYIQKT
                                                                                                                                                                                             346 AA; 37448 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLrel. 15, Created)
(TrEMBLrel. 15, Last sequence update)
(TrEMBLrel. 21, Last annotation update)
                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     phosphofructokinase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             510
--SKLGLPMIGVPKTIDKDLEETDYTIGPDTAVEVVVDAIKRLRDTARS
                                                                                                                                            13.4%; Score 305; DB 2; 27.5%; Pred. No. 2.2e-14; tive 73; Mismatches 155
                                                                                                                                          73;
                                                                                                                                                                                             50C03B64BA7927F1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
                                               346
                                                                                                                                              155;
                                                                                                                                                                   Length 346;
                                                                                                                                              Indels
                                                                                                                                             54
                                                                                                                                             Gaps
                         213
                                                                     153
 161
                                                                                             61
                                               107
                                                                                                                      93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         445
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     205
```

```
RESULT
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OPPUTE
OP
   F
                                       Ś
                                                                                                            탏
                                                                                                                                                      ई
                                                                                                                                                                                                                        봊
                                                                                                                                                                                                                                                                         Ş
                                                                                                                                                                                                                                                                                                                                        문
                                                                                                                                                                                                                                                                                                                                                                                     Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ð
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               뫊
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
Best Local S
Matches 112
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q9FJU5 PRELIMINARY; PRT; 488 AA.

Q9FJU5;

Q9FJU5;

Q9FJU5;

Q9FJU5;

Q9FJU5;

Q9FJU5;

Q1-MAR-2001 (TrEMBLrel. 16, Created)

Q1-MAR-2001 (TrEMBLrel. 21, Last sequence update)

Q1-JUN-2002 (TrEMBLrel. 21, Last annotation update)

Pyrophosphate-dependent phosphofructo-1-kinase-like prot

Pyrophosphate-dependent (Mouse-ear cress)

Arabidopsis thaliana (Mouse-ear cress)

Arabidopsis thaliana (Mouse-ear cress)

S Arabidopsis thaliana (Mouse-ear cress)

C Eukaryota; Viridiplantae; Streptophyta; Embryophyta; Tra

C Spermatophyta; Magnoliophyta; eudicotyledoms; core eudic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
STRAIN-COlumbia;
MEDLINE-98403884; PubMed-9734815;
Kotani H., Nakamura Y., Sato S., F
Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR000023; Ppfruckinase.
Pfam; Pr00365; PFK; 1.
PRINTS; PR00476; PFFFECTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Structural analysis of Arabidopsis thaliana chromosome 5. VI. Sequence features of the regions of 1,367,185 bp covered by 19 physically assigned Pl and TAC clones.";
DNA Res. 5:203-216(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; AB013392; BAB09881.1; -. HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ហ
   289
                                                                                                            250
                                                                                                                                                                     206
                                                                                                                                                                                                                           190
                                                                                                                                                                                                                                                                               148
                                                                                                                                                                                                                                                                                                                                        150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         333
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         274
                                                                                                                                                                                                                                                                                                                                                                                              88
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     214 NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                       96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
   IPESPFYLEGEGGLFEFIERRLKDHGHMV--
                                                                                                               HVEAESNENGIGFV--KLMGRYSGYIA--
                                                                                                                                                               NVVAENNANPRMII VHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVF
                                                                                                                                                                                                                                                                                                                                        KV---VNDIHKRGGTIIGTSR---
                                                                                                                                                                                                                                                                                                                                                                                           EVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHT
                                                   VPEMAIDLEARA-----KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDA 318
                                                                                                                                                                                                                                                                            IGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYF--M
                                                                                                                                                                                                                                                                                                                                                                                                                                                    IVTCGGLCPGLNTVIREVVSSLSYMYGVKRILGIDVSL-----GGYRGFYAKNTIPLNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ILTAGGLAPCINSAIGSL-----IERYTEIDPSIBIICYRGGYKGLLLGDSYPVTA
                                                                                                                                                                                                                           IGGDGTQRGASVIFEEIRRRRLKVAVVGIPKTIDNDIPVIDKSFGPDTAVEBAQRAINAA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LABEIQXXLGIBTRAVILS-HLQRGGSPSIRDRIMGLLLGKKAVDLVHEGKSGLF--VAV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KGNELVPVDITLIE-GKTKNVDPAFYESV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NGNVLRAIEFPRIKGGKPFNIDTDWFNSM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FGEQFAQMIGAEKTLYQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVIGHDED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HARVIVV-BIMGRHAGWLAL----YGGLAGGADY-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EDLYNHIRKLYARGRNHAVVAIAEGVQLPGFTYQ----KGQEGMVDAFGHIRLGGV--GNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EAEAKRIREVMDK-VDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKIDAVNPGKW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   488 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53781 MW; ABA526AED9213B17 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12.3%; Score 282; DB 10; 26.8%; Pred. No. 1.9e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 60; Mismatches 158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Asamizu
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          M
IVLAEGAGQDLMCKSMES
                                                                                                                                                                                                                                                                                                                                        -GGHDTNKI-VDSIQDRGINQVYI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Kaneko T., Miyajima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             core eudicots;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 488;
                                                                                                            -----MYATLASRDVDCCL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Tracheophyta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----ILIPEVEPNI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .
.
                                                                                                                                                                                                                                                                                                                                                                                           147
340
                                                                                                                                                                                                                                                                                                                                        189
                                                                                                            288
                                                                                                                                                                  265
                                                                                                                                                                                                                                                                                  205
                                                                                                                                                                                                                                                                                                                                                                                                                                                    149
                                                                                                                                                                                                                           249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         392
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   255
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        273
```

```
RESULT CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONTROL OF CONT
                                                  S
   밁
                                                                                                                       g
                                                                                                                                                                         Ś
                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A Yamada K., Liu S.X., Sakano H., Pham P.K., Banh J., Chung M.K.,
A Dale J.M., Gibson H.A., Goldsmith A.D., Jiang P.X., Lee J.M.,
A Quach H.L., Tang C., Toriumi M., Yu G., Bowser L., Carninci P.,
A Chen H., Cheuk R., Hayashizaki Y., Ishida J., Jones T., Kamiya A.,
A Karlin-Neumann G., Kawai J., Kim C., Koesema E., Lam B., Lin J.,
A Meyers M.C., Miranda M., Narusaka M., Nguyen M., Palm C.J.,
A Meyers M.C., Miranda M., Narusaka M., Nguyen M., Palm C.J.,
A Sakurai T., Satou M., Seki M., Shinn P., Southwick A., Tracy S.E.,
A Shinozaki K., Davis R.W., Ecker J.R., Theologis A.;
Theologis A.;
Trull Length CDNA of gene MIK19 8/AT595630 (GI:10176767).";
Submitted (JUN-2001) to the EMBL/GenBank/DDBJ databases.
R EMBL; AY040055; AAK64113.1; -.
R EMBL; AY040055; AAK64113.1; -.
                                                                                                                                                                                                                                                                                                                                                        Matches
                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-JUN-2001 (TrEMBLrel. 17, Created)
01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Putative pyrophosphate-dependent phosphofructo-1-kinase.
MIK19-B/AT5G5630.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Theologis A.;
"Full Length cDNA of
Submitted (MAR-2001)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Yamada K., Liu S.X., Sakano H., Pham P.K., Banh J., Chung M.K., Goldsmith A.D., Lee J.M., Quach H.L., Toriumä M., Yu G., Bowser L., Carninci P., Chen H., Cheuk R., Hayashizaki Y., Ishida J., Jones T., Kamiya A., Kariin-Neumann G., Kawai J., Kim C., Lam B., Lin J., Kimranda M., Narusaka M., Nguyen M., Palm C.J., Sakurai T., Satou M., Seki M., Shinn P., Southwick A., Shinozaki K., Davis R.W., Ecker J.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Arabidopsis thaliana (Mouse-ear cress),
Eukaryota; Viridiplantae; Streptophyta; Embryophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core e
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRINTS; PRO0476; PHPRCTKINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=3702;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9C5J7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ò
   196
                                                           157
                                                                                                                       153
                                                                                                                                                                                                                                                                                                                                                  109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Pro; IPR000023; Ppfruckinase. PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 399
                                                                                                                                                                            97
                                                                                                                                                                                                                                       96
                                                                                                                                                                                                                                                                                             37
                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                       HKRGGTIIGTSR.
ASVIFEEIRRRLKVAVVGIPKTIDNDIPVIDKSFGFDTAVEEAQRAINAAHVEAESNEN
                                                        AADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYF--MNVVAENNAN
                                                                                                                                                                         QRFGGSVIGNSRVKLTNVKDCVKRGLVKBGEDPQKVAADQLVKDGVDILHTIGGDDTNTA
                                                                                                                                                                                                                                 ILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AVHGAM --- AGYTGYTSGLVNGR-QTYIPFYRITETQNNVVITDRMWAR-LLSSTNQP 451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AVECAFRRESGVIGHDED-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGNKLLKDV--GLWLSQSIKDHFKKNKMYMNLKYIDFTYMIRAVPSNASDNVYCTLLAQS 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRLIKSCADL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         485
                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         À
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53482 MW;
                                                                                                                                                                                                                                                                                                                                                                                 12.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  gene MIK19.8/AT5g56630 {GI:10176767}."; to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                  61;
                                                                                                                                                                                                                                                                                                                                                                                 Score 281.5;
Pred. No. 2e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -NGNVLRAIEFPRIKGGKPFNIDTD--WFNSMLSEIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         6F0C6CFF43EAA7B5 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                   GGHDTNKI-VDSIQDRGINQVYIIGGDGTQRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              485
                                                                                                                                                                                                                                                                                                                                                                                    2e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Embryophyta; Tracheophyta;
edons; core eudicots; Rosidae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              $
                                                                                                                                                                                                                                                                                                                                                                                                             DB 10;
                                                                                                                                                                                                                                                                                                                                                     166;
                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                             485;
                                                                                                                                                                                                                                                                                                                                                     73
                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    428
255
                                                        214
                                                                                                                   195
                                                                                                                                                                            156
                                                                                                                                                                                                                                    152
                                                                                                                                                                                                                                                                                             96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       374
```

```
RESULT
Q8XL57
δ
                            뫉
                                                     Ś
                                                                                    ₽
                                                                                                          Ś
                                                                                                                                        밁
                                                                                                                                                               Q
                                                                                                                                                                                               문
                                                                                                                                                                                                                     ठ
                                                                                                                                                                                                                                                    맑
                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               よ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ø
                                                                                                                                                                                                                                                                                                           Best Local Similarity Matches 113; Conserv
                                                                                                                                                                                                                                                                                                                                     Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Q8XL57; PRELIMINARY;
Q8XL57;
01-MAR-2002 (TrEMBLrel. 2
01-MAR-2002 (TrEMBLrel. 2
01-JUN-2002 (TrEMBLrel. 2
                                                                                                                                                                                                                                                                                                                                                                PRODOM; PD000707; Ppfruckinase; 1.
PROSITE; PS00433; PHOSPHOPRUCTOKINASE;
Kinase; Complete proteome.
SEQUENCE 366 AA; 39514 MW; C5614C4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NCBI
                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR000023; Ppfruckinase
Pfam; PF00365; PFK; 1.
PRINTS; PR00476; PHFRCTKINASE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            flesh-eater.";
Proc. Natl. Acad. Sci. U.S.A. 99:996~1001(2002).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Shimizu T., Ohtani K., Hirakawa H., Ohshima K., Yamashita A.,
Shiba T., Ogasawara N., Hattori M., Kuhara S., Hayashi H.;
"Complete genome sequence of Clostridium perfringens, an anae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Clostridium perfringens.
Bacteria; Firmicutes; Clostridia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              6-phosphofructokinase
PFK OR CPE1185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AP003189; BAB80891.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PubMed=11792842;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TaxID=1502;
  315
                                                                                    163
                                                                                                             200
                                                                                                                                         109
                                                                                                                                                                    140
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               384
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          347
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  215
                                                                                                                                                                                               58
                                                                                                                                                                                                                           88
                                                                                                                                                                                                                                                     ï
                                                                                                                                                                                                                                                                                 28
                                                                                                                                                                                                                                                    MYQPIKKIAILTGGGDCPGLNAVIRA-VTRTAILKYGYEVIGYKFGYRGLYNNDF--VKL
                                                                                                                                                                                                                                                                              LMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTA
                                                                                                            CARYFMIVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESY
                                                                                                                                                                  DGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFFIKQSLGAWTAAEQ 199
                                                                                                                                                                                             DLDSVSGILHR-GGTILHSSNKDNLFDYQVEDENGK----IVK--KDVSDVGVENLKK
 PRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTUVQKSGYFARASASNVDDMRLIKSCADL
                             ---DVILLPEIPYDINKIVEKVKEREEAGKQFTI-IVVAEGAKPKDGEVVVS-----
                                                     EVHAVFVPEMAIDLE--ABAKRLREVMDKVDCVNIFVSEGA---GVEAIVAEMQAKGQEV
                                                                                                                                                                                                                         EVRKKAGVLQRFGGSVIGNS----RVKLTNVKDCVKRGLVKEGEDPQKVAADQLVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FROM N.A.

Type A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AGYTGYTSGLVNGR-QTYIPFYRITETQNNVVITDRMMAR-LLSSTNQP
                                                                                    ATEALDRIHTTAESHHRIMLL-EVMGRNAGWIAL-----
                                                                                                                                         EĞVDALVVİĞĞDĞTLTSARDF-----SRKĞVNVİĞVPKTIDNDLLATDVTFĞFNTATEI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GEGGLPEPIERRIKDHGHMV----IVLAEGAGQDLMCKSMES----TPMDASGNKLLKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GIGEV--KLMGRYSGYIA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SGVIGHDED--NGNVLRAIEFPRIKGGKPFNIDTD--WFNSMLSBIGQP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---GLWLSQSIKDHFKKNKMYMNLKYIDFTYMIRAVPSNASDNVYCTLLAQSAVHGAM---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ASA-----KRIREVMDKVDCVNI FVSEGAGVEAIVAEMQAKGQEVPRDAPGHIKIDAV
                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                   39514 MW; C5614C41AE638C31 CRC64;
                                                                                                                                                                                                                                                                                                                        12.2%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20,
                                                                                                                                                                                                                                                                                                           67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Last sequence up
                                                                                                                                                                                                                                                                                                           Score 278; DB 16;
Pred. No. 2.4e-12;
7; Mismatches 127;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clostridiales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 366
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -MYATLASRDVDCCLIPESPFYLE
                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Clostridiaceae;
                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                            124;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               428
                                                                                                                                                                                                                                                                                                           Gaps
                             ä
                                                                                                                                                                                                                         139
                               253
                                                        314
                                                                                                                                         162
                                                                                                                                                                                                108
                                                                                    203
                                                                                                             259
                                                                                                                                                                                                                                                     57
                                                                                                                                                                                                                                                                                 87
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             401
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 346
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        294
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      383
```

4

```
RASULT QBAGCO ID AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9. AC Q9.
                                                                                                                                                                               밁
                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ď,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q9AGC0
Q9AGC0;
01-JUN-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRINTS: PR00476; PHFRCTKINASE.
PRODOM: PD000707; PDFTRUCKINASE;
PROSITE: PS00433; PHOSPHOFRUCTOKINASE;
Glycolysis; Kinase; Transferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            01-JUN-2001 (TrEMBLrel. 17, Created)
01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-OCT-2002 (TrEMBLrel. 22, Last annotation update)
Phosphofructokinase-like protein (EC 2.7.1.11) (6-p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Submitted (JAN-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales; Pseudonocardineae; Pseudonocardiaceae; Amycolatopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           InterPro; iPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           7-phosphate
S699.¶;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=S699
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FRUCTOSE 1,6-BISPHOSPHATE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Kuan L., Mueller M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=33910;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Amycolatopsis mediterranei (Nocardia mediterranei).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Characterization
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (Phosphohexokinase)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ω
                  330 GKWFGEQFAQMIGAEKTLYQKSGYFARASASNVDDMRLIKSCADLAYECAFRRESGYIGH
                                                                              199
                                                                                                                                                                                  160
                                                                                                                                                                                                                                                                                   106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           101;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         254
                                                                                                                                                                                                                                                                                                                              154 NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFWNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                       94 GVLQRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKOGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AF336847;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
                                                                                                                                                                                                                          NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRABWLPELGLTRESYEVHAVFVPEMAIDL
                                                                           DQVVSWVERRFEKEFAPIIVVAEGALPEG-----GEEKLLTGEKDAFGHVRLGGI--
                                                                                                                            EAEAKRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEV----PRDAFGHIKLDAVNP
                                                                                                                                                                               HHRALVV-EVMGRHAGWIALHS
                                                                                                                                                                                                                                                                             LGVAKEL----TDDGIGVVGVPKTIDNDLGATDYTFGFDTAVSIATEAIDELHTTAES
                                                                                                                                                                                                                                                                                                                                                                                 DILTR-GGTILRSSRTNPYKVEGGVDK--IKQ-----VLADQ---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RVGVLTGGGDCPGLNAVIRAVVRKGIEVH-GWDFVGFRNGWNGPLTGDSRPL--GLNDVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEIGQPKGGKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 VDDSPDPIRLGGI------ANKLAIDLEG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A----EKGNKV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ~---HEIRSTVLGHIQRGGNTSTYDRILSTKYGVKAVEL-----INSNLFGNNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AVECAFRRESGVIGHDEDNGNV------LRAIEPPRIKGGKPFNIDTDWFNSML
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  341 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAK28147.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and cioning of three 3-deoxy D-arabinoheptulosonate ase iscenzymes from Amycolatopsis mediterranei
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               36272 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 12.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    August P.R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STEP OF GLYCOLYSIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 274.5; DB:
Pred. No. 3.9e-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2B5C28E7BBD57065 CRC64;
  ..
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Pogosova-Agadjanyan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   341
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (6-phosphofructokinase)
                                                                                                                                                                               GLAGGA---SVILVPERHFNV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [3]
                                                                                                                                                                                                                                                                                                                                                                                    -GVDALIAIGGEDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Floss
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      65;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -LIKN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gape
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H.G.,
                                                                                                                                                                                                                                                                                                                                                                                                                                  153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        93
                          389
                                                                                                                                                                               198
                                                                                                                                                                                                                                                                                159
                                                                                                                                                                                                                                                                                                                                                                                    105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                            329
                                                                                                                                                                                                                               273
                                                                                                                                                                                                                                                                                                                                 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   422
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RESULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECURTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECULTION OF SECUL
S
                                                묽
                                                                                           Ś
                                                                                                                                                 F
                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                     문
                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                      문
                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        묾
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         뭏
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-JUN-1998
01-JUN-1998
01-MAR-2003
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=98065943; PubMed=9403685;
Fraser C.M., Casjens S., Huang W.M., Sutton G.G., Clayton R.,
Lathigra R., White O., Ketchum K.A., Dodson R., Hickey E.K.,
Dougherty B., Tomb J.-P., Fleischmann R.D., Richardson D.,
Peterson J., Kerlavage A.R., Quackenbush J., Salzberg S., Har
van Vugt R., Palmer N., Adams M.D., Gocayne J.D., Weidman J.
Utterback T., Watthey L., McDonald L., Artiach P., Bowman C.,
Garland S., Fujii C., Cotton M.D., Horst K., Roberts K., Hatc
Smith H.O., Venter J.C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Transferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRINTS; PR00476; PHERCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            051669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            051669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; AE001172; AAC67070.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=ATCC 35210 /
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TIGR; BB072
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wature 390:580-586(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NCBI_TaxID=139;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Borrelia burgdorferi (Lyme disease spirochete)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            InterPro; IPR000023; Ppfruckinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Genomic sequence of a Lyme disease spirochaete, Borrelia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
379
                                                337
                                                                                                 323
                                                                                                                                                    285
                                                                                                                                                                                                    274
                                                                                                                                                                                                                                                     244
                                                                                                                                                                                                                                                                                                      214
                                                                                                                                                                                                                                                                                                                                                         184
                                                                                                                                                                                                                                                                                                                                                                                                         154
                                                                                                                                                                                                                                                                                                                                                                                                                                                             141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         390
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         249
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          94 GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
AFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNSMLSEIGQP
                                                                                                                                                                                                                                                     AYNGIGLVKVMGRDSGFIAAHTA------LSSNDVNFCLIPELDFDI
                                                                                                                                                                                                                                                                                                   NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                       NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGARYFMVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                          DDINKFGGTILGSS------RGGIKPVE----IVDTLERMNINMIFNIGEDGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GTWLADEIAHRTGKESRAV-VLGHVQRGGTPTAYDRVLATRFGLNAVDAVADGDFGVM--
                                                                                                 KLDAVNPGKWFGEQFAQMIGAEK---TLVQ-KSGYFARASASNVDDMRLIKSCADLAVEC
                                                                                                                                                                                                                                                                                                                                                      QKGSLLIABEIEKRNLKIAVVGIPKTVDNDFMFVQKSFGFETAVEQAVAAVAGAHFEANS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           KAAITTCGGLCPGFNDVIRSIVRTLWKIYGVRNIYGVKFGYQGLLPBSNSPFINLNPDVV 140
                                                                                                                                                 EGPNGFLVHLERRILEKESLEBIPHAVILIAEGAG-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DEDNGNVLRAIEFPRIK 406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----VALKGTDIVRVK 317
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            12, 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Spirochaetes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gomplete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TrEMBLiel. (TrEMBLiel. (TrEMBLiel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRELIMINARY;
                                                GLYIKDKITEYFKAKNIQFTLKYIDPSYIIRSSPANASDSLYCARLGSNAVHA
                                                                                                                                                                                               --AKRL--REVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVP--RDAFGHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           B31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.8%; Score 270; DB 16;
24.9%; Pred. No. 1.3e-11;
tive 69; Mismatches 177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  06, Last sequence update)
23, Last annotation update)
6-phosphate 1-phosphotransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Spirochaetales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A4BA292360032D51 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            448
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Spirochaetaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  177;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 448;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                                                                                                    -QKYFDHFPKKKDDSGNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    K., Hatch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Borrelia.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (PPK).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hanson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gwinn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3
                                                                                                                                                                                                                                                                                                                                                                                                       213
                                                                                                                                                                                                                                                                                                                                                                                                                                                       183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          153
                                                                                                                                                 336
                                                                                                                                                                                                  322
                                                                                                                                                                                                                                                     284
                                                                                                                                                                                                                                                                                                   273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              93
                                                                                                                                                                                                                                                                                                                                                      243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       305
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11,
```

밁 S

몽

395

AMAGKTKMLISLWSTKFVHIPIKWAVIDRNK-VNPNGSFWRDVLSSTGQP

443

••

```
RESULT

1D 4AA

1D 4AA

1D 4AA

1D 4AA

1D 4AA

1D 4AA

1D 4AA

1D 7 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

1D 10 11

   멼
                                                        Ś
                                                                                                                                  맑
                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local S
Matches 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Q94AA4
Q94AA4;
Q94AA4;
Q1-DBC-2001 (TrEMBLrel. 19,
01-DEC-2001 (TrEMBLrel. 19,
01-MAR-2003 (TrEMBLrel. 23,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (MAR-2002) to the EMBL/GenBank/DDBJ databases.
EMBL; AY9049245; AAK83587.1; -
EMBL; AY90267; AAL90928.1; -
InterPro; IPR000023; Ppfruckinase.
Pfam; PP00365; PFK; 1.
PFAm; PF00365; PFK; 1.
PRINTS; PR00476; PFFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
SEQUENCE 489 AA; 53666 MW; AR2CIEA15B64F7B0 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AT4926270/T25K17_80.
Arabidopsis thallana (Mouse-ear cress).
Bukaryota, Viridiplantae, Streptophyta; Embryophyta; Tracheophyta;
Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae;
eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kim C.J., Chen H., Cheuk R., Meyers M.C., Shinn P., Banh J.,
Bowser L., Carninci P., Chang B., Dale J.M., Goldsmith A.D.,
Hayashizaki Y., Ishida J., Jones T., Kamiya A., Karlin-Neumann G.,
Kawai J., Lam B., Lee J.M., Lin J., Miranda M., Marusaka K.,
Nguyen M., Onodera C.S., Palm C.J., Quach H.L., Sakurai T., Satou M.,
Seki M., Southwick A., Tang C.C., Toriumi M., Wu H.C., Yamada K.,
Yamamura Y., Yu G., Yu S., Shinozaki K., Davis R.W., Theologis A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.

Cheuk R., Chen H., Kim C.J., Koesema E., Meyers M.C., Banh J.,
Cheuk R., Chen H., Kim C.J., Koesema E., Meyers M.C., Banh J.,
Cheuk R., Chen H., Kim C.J., Koesema E., Meyers M.C., Banh J.,
Ebowser L., Carninci P., Dale J.M., Goldsmith A.D., Hayashizaki Y.,
Ishida J., Jiang P.X., Jones T., Kamiya A., Karlin-Neumann G.,
Kawai J., Lam B., Lee J.M., Lin J., Liu S.X., Miranda M., Narusaka
Nguyen M., Onodera C.S., Palm C.J., Pham P.K., Quach H.L., Sakurai
Satou M., Sei M., Southwick A., Tang C.C., Toriumi M., Yamada K.,
Yamamura Y., Yu G., Yu S., Shinozaki K., Davis R.W., Theologis A.,
Ecker J.R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.

Kim C.J., Chen H., Cheuk R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Arabidopsis cDNA clones.";
Submitted (JUL-2001) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Arabidopsis ORF clones.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               E O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        _TaxID=3702;
   297
                                                                  277
                                                                                                                                                                                                 217
                                                                                                                                                                                                                                                                    196
                                                                                                                                                                                                                                                                                                                                157
                                                                                                                                                                                                                                                                                                                                                                                            153 HKRGGTILGTSR-------GHDTTKI-VDSIQDRGINQVYIIGGDGTQRG 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    105;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                              MLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAE
GGLFEYIEKRIKESGHMV----LVIAEGAGQDLMSKSMESM---TLKDASGNKLLKDV--
                                                                                                                                  GIGVVKLMGRYSGFIA-
                                                                                                                                                                                                                                                                                                       AADLAAFLARNNYGLTVIGLEKTVDNDVFFIKQSLGAWTAAEQGARYFMNVVAENNANER 216
                                                               A-----KRIREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKIDAVNP 329
                                                                                                                                                                                                                                                             ASVIFEEIRRRGLKVAVIGIPKTIDNDIPVIDKSFGFDTAVEEAQRAINAAHVEAESIEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                               QRFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDINTA 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IVTCGGLCPGLNTVIREIVSSLSYMYGVKRILGIDGGYRGFYAKNTVSLDSKV---VNDI 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.6%; Score 266; DB 10; Length 489; llarity 25.7%; Pred. No. 2.9e-11; Conservative 61; Mismatches 172; Indels 7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Created)
Last seg
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   489
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ä
                                                                                                                              --MYATLASRDVDCCLIPESPFYLEGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ;;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 96
347
                                                                                                                                                                                                 276
                                                                                                                                                                                                                                                                 255
                                                                                                                              296
```

_	_	_	_				_					·				•						
8	á	문	Ş	망	Q	<u>B</u>	Ş	Db Db	8	В	Ś	음 성	Ma Ma	RT TO THE RT TO			SAS	RESU Q276	₽ .	8	문	ঠ
394 GLVICHHNNFVSVPIDRTSYYIKRVNTDGPLYTMMSAIEKPK 436	385 G-VIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDW-FNSMLSEIGQPK 429	334 INYLRDSITKYLKSIGIEEHTIKFVDPSYMIRSAPCSAADAHFCMCLANAAVHVAMAGKT 393	327 VNPGKWFGEQFAQMIGAEKTIVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRES 384	283 PITQICEFVGKRIMSKGHVV-IVVAEGALQNQKPKDLDLGTDKSGNILHWDS 333	272 DLEABAKRLREVMDKVDCVNIFVSEGAGVBAIVABMQAKGQBVBRDAFGHI-KLDA 326	42 KSAKNGIGIVRLMGRDAGFIALYASLANG	212 NANPRHLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAI 271	82 GTLRGANAINKELRRRKVPITVVGIPKTIDNDICYTDSTPGFQTAVGLSQEAINAVHSEA 2	52 DTNTAAADLAAFLARNNYGLTVIGLFKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAEN 2	140 -VSDIKQKGGSILGTSRGAQSPEVMAQFLIDNNFNILFTLGGD 181	92 KAGVIQRFGGSVIGNSRVKLTNVKDCVKRGIVKEGEDPQKVAADQLVKDGVDILHTIGGD 151	34 XVAILTAGGLAPCLNSAIGSLIBRYTBIDPSIBIICYRGGYKGLLLGDSYPVTAEVRK 91	Query Match 11.5%; Score 263.5; DB 5; Length 436; Best Local Similarity 26.3%; Pred. No. 3.7e-11; Matches 108; Conservative 68; Mismatches 164; Indels 71; Gaps 16;	Prophosphate dependent phosphofructokinase lecular cloning, recombinant expression an rophosphate analogues."; ochem. J. 316.57-6511951. BL; X82173; CAA57659.1; SP; P00512; 3FFX. CAA57659.1; SP; P00512; 3FFX. 1. INTS; PR00365; PFX; 1. INTS; PR00476; PHFRCTKINASE.	<pre>(/ppI-ppK. (/ppI-ppK. tramoeba histolytica. karyota; Entamoebidae; Entamoeba. BI_TaxID=5759;] DLINE=96235172; PubMed=8645233; DLINE=96235172; PubMed=8645233;</pre>	-NOV-1996 (TrEMBLEE]. 01, Last se -MAR-2003 (TrEMBLEE]. 23, Last an rophosphatefructose-6-phosphate © 2.7-1.90).	-NOV-1996 (TreMBIre) 01 (Treated)	DOMASI DEETININADY. DET. 436 AA	08 YISGLVNGRQTYIPFYRITEKONHVVITDRMMAR-LLSSTKOP		348 GLWLSQSIKDHFNQKKWYMNLKYIDPTYMIRAVPSNASDNVYCTLLAQSAVHGAMAGYTG 407	330 GKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESG 385

RESULT 12

```
1D 994JI2
AC 994JI2;
AC 994JI2;
AC 994JI2;
AC 994JI2;
DT 01-DEC-2001
DT 01-DEC-2001
DT 01-MAR-2003
DE PUTATATIVE PY
DE DOSSPOOTS SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS OTYZA SATIVA
OS PERAIN-EV. N;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SASAI T., M;
PA SA
                                                                                                              밁
                                                                                                                                                     δ
                                                                                                                                                                                                                          뭐
                                                                                                                                                                                                                                                                       $
                                                                                                                                                                                                                                                                                                                            맑
                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 맒
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Oryza sativa (Rice), and Oryza sativa (Rice), and Oryza sativa (Japonica cultivar-group).

Bukaryota, Viridiplantae, Streptophyta, Embryophyta; Tracheophyta; Eucharyota, Nagnoliophyta, Lillopsida, Poales, Poaceae, Spermatophyta, Nagnoliophyta, Lillopsida, Poales, Poaceae, Shrhartoideae, Oryzae, Oryza.

NCBI TaxID=4530, 39947;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sasaki T., Matsumoto T., Yamamoto K.; "Oryza sativa nipponbare(GA3) genomic DNA, clone:OSJNab0021A09.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SABAKI T., MATSUMOTO T., Yamamoto K.;
"Oryza sativa nipponbare(GA3) genomic DNA, chromosome i,
clone:P0638D12.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-MAR-2003 (TrEMBLrel. 23, Last annotation update)
Putatative pyrophosphate-fructose-6-phosphate1 phosphotransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; AP002972; BAB55499.1; -. EMBL; AP003218; BAB89469.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          phosphotransferase).
P0638D12.7 OR OSJNBB0021A09.21.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          InterPro; IPR000023; Ppfruckinase
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gramene; Q94JI2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Submitted (FEB-2001) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  STRAIN=cv. Nipponbare;
Sasaki T., Matsumoto T.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Submitted (NOV-2000) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (Putative pyrophosphate--fructose-6-phosphatel
  501
                                                     383
                                                                                                                                                                                                                          390
                                                                                                              441
                                                                                                                                                                 327
                                                                                                                                                                                                                                                                                   274
                                                                                                                                                                                                                                                                                                                                     349
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 154 NTAAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAAEQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 189
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ω
4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   96;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KVAILTAGGLAPCLNSAIGSLIERYTEIDESIEIICYRGGYKGLLLGDSYPVTAEVRKKA
  YSFTVG
                                                     ESGVIG
                                                                                                        LDVGLWLTHKIKDYCKNKKMEMTIKYIDPTYMIRAIPSNASDNVYCTLLAHSAIHGAMAG
                                                                                                                                                              VNPGKWFGEQFAQMIGAEKTLVQ----KSGYFARASASNVDDMRLIKSCADLAVECAFRR
                                                                                                                                                                                                                                                                       EARA-----KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDA
                                                                                                                                                                                                                                                                                                                                  AENGIGLVKLMGRYSGFIA--
                                                                                                                                                                                                                                                                                                                                                                                        NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                 QKGAYETYKETRRRGEKVAVAĞVPKTIDNDTAVIDKSFGFDSAVEBAQRATDAAHVEASS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NDIHKRGGTVLGTSR----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GVLORFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                          EGEGGLFEYIEKRLKENNHMV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KACIVTCCGLCPGLNTVIRELVCGLSHMYNVNDIFGIQNGYKGFYSSNYLPMTP---KSV 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               586 AA; 64060 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nipponbare;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                     388
506
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.5%; Score 263.5; DB 10; 26.2%; Pred. No. 5.9e-11; tive 53; Mismatches 158;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -----GGHDTKKI-VDNIQDRGINQVYIIGGDGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28DE4F6F800386A3 CRC64;
                                                                                                                                                                                                                    - IVVAEGAGQDLIAKSIAAADQ---IDASGNKLL--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    985
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       chromosome 1,
                                                                                                                                                                                                                                                                                                                                  -MYATLASRDVDCCLIPESPFYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   586;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                        500
                                                                                                                                                                 382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      153
                                                                                                                                                                                                                       440
                                                                                                                                                                                                                                                                                                                                  389
                                                                                                                                                                                                                                                                                                                                                                                        273
                                                                                                                                                                                                                                                                                                                                                                                                                                                 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
```

```
RESULT 13

QPIG7

ID QPIG7

ID QPIG7

AC QPIG7

DT 01-CC

DT 01-CC

DT 01-CC

DT 01-CC

DT 01-CC

CO COLOR

CO COLOR

CO COLOR

CO COLOR

CO COLOR

CO COLOR

CO COLOR

CO COLOR

CO COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COLOR

COL
  문
                                       S
                                                                                                문
                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                           닭
                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                         밁
                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                   á
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Kinase.
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Oryza sativa nipponbare(GA3) genomic DNA, clone:P0671B11.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase
PROSITE; PS00165; DEHYDRATASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (JUL-2000) to the EMBL/GenBank/DDBJ EMBL; AP002743; BAA99438.1; -. EMBL; AP002746; BAB12686.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sesaki T., Matsumoto T., Yamamoto K.;
"Oryza sativa nipponbare(GA3) genomic DNA,
clone:P0710E05.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bukaryota; Viridiplantae; Streptophyta; En
Spermatophyta; Magnoliophyta; Liliopsida;
Ehrhartoideae; Oryzeae; Oryza.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q9LG72
Q9LG72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Pfam; PF00365; PFK;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gramene; Q9LG72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
STRAIN=CV. NIPPONBARE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Putative pyrophosphate-dependent phosphofructo-1-kinase P0710E05.25 OR P0671B11.1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-OCT-2000 (TrEMBLrel. 15,
01-OCT-2000 (TrEMBLrel. 15,
01-MAR-2003 (TrEMBLrel. 23,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro; IPR000023; Ppfruckinase.
InterPro; IPR000634; S/T_dehydrtse
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Submitted (JUL-2000) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Oryza sativa (Rice)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=4530;
  683
                                                                                                626
                                                                                                                                            329
                                                                                                                                                                                              575
                                                                                                                                                                                                                                             276
                                                                                                                                                                                                                                                                                            534
                                                                                                                                                                                                                                                                                                                                           216
                                                                                                                                                                                                                                                                                                                                                                                            474
                                                                                                                                                                                                                                                                                                                                                                                                                                         156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             431
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           107;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            96
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         36
AGYTGETVAPVNGRHAY I PEYRI TEKONKVVI TORMWAR - VLCSTNOP
                                                                                                                                                                                                                        EA-----KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAXGQEVPRDAFGHIKLDAVN
                                                                                                                                                                                                                                                                                              NGIGVVKLMGRNSGFIA----
                                                                                                                                                                                                                                                                                                                                                                                                                                         AAADLAAFLARNNYGLTVIGLEKTVDNDVFPIKQSLGAWTAABQGARYEMNVVAENNANP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LORFGGSVIGNSRVKLINVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AIVTCGGECPGENTVIRELVCGLYDMYGVTSVVGIEGGYKGPYSRNTVALTP---KSVND
                                              SGVIGHDEDNGNVLRA-IEFPRI--KGGKPFNIDTDWFNSMLSEIGQP 428
                                                                                                VGLWLSQKIKDHFKKKRNFPITLKYIDPTYMIRAVRSNASDN----VYCTLLAHSALHGAM
                                                                                                                                            PGKWFGEQFAQMIGAEKTL-----VQKSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                           RMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEA
                                                                                                                                                                                                                                                                                                                                                                                          GASVIFQEVEREGLECSVVGVFETIONDIQVIDESFGFDTAVEBAQRAINAAHVBABSAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGV
                                                                                                                                                                                                KGGLLEFIEKRLKDNGHMV----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         775 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nipponbare;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRELIMENARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ppfruckinase; 1.
DEHYDRATASE_SER_THR; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84371 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  11.4%; Score 260.5; DB 10; 26.2%; Pred. No. 1.5e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Last
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----GGHDTGKI-VDSIKDRGINQVYIIGGDGTQK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         E4390F7D8A9C907A CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches 180;
                                                                                                                                                                                              IVVAEGAGODLIAKSMNFVDTQ---DASGNKLL--LD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      sequence update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  775
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Embryophyta; Tracheophyta;
a; Poales; Poaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Å
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         chromosome 1,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   chromosome 1,
                                                                                                                                                                                                                                                                                            -MYATLASRDVDCCLIPESPFYLEG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length
729
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PAC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          775;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            155
                                                                                                                                            383
                                                                                                                                                                                                                                             328
                                                                                                                                                                                                                                                                                                                                                                                          533
                                                                                                                                                                                                                                                                                                                                                                                                                                         215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        430
                                                                                                                                                                                                                                                                                         574
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          473
                                                                                                                                                                                              625
                                                                                                                                                                                                                                                                                                                                           275
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         95
```

```
RESULT
Q24812
AC Q24812
AC Q24812
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC Q2
AC
  RESULT 15
QOSTGO
ID QOSTGO
AC QOSTGO
DT 01-MA
DT 01-OC
DE PYTOF
GN T25K1
OC Bukai
                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              g
                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local S
Matches 99
                                                                                                                                                     Q9STQ7
Q9STQ7;
Q1-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Q24812
Q24812;
Q1-NOV-1996
Q1-NOV-1996
Q1-MAR-2003
01-MAY-2000 (TERMBLrel. 13, Last sequence update) 01-0CT-2002 (TERMBLrel. 22, Last annotation updat Pyrophosphate-dependent phosphofructo-1-kinase. T25K17,80 OR AT4C26270.
Arabidopsis thaliana (Mouse-ear cress). Embryophy Eukaryota; Viridiplantae; Streptophyta; Embryophy
                                                                                                    01-MAY-2000
01-OCT-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; U12513; AAA92671.1; --
HSSP; P00511; 3PFK.
InterPro; IPR000023; Ppfruckinase.
Pfam; PF00365; PFK; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Huang M., Albach R.A., Chang K.P., Tripathi R.L., Kemp R.G "Cloning and sequencing a putative pyrophosphate-dependent phosphofructokinase gene from Entamoeba histolytica."; Biochim. Biophys. Acta 1260:215-217(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
MEDLINE=95143279; PubMed=7841199;
Huang M., Albach R.A., Chang K.P.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kinase: Transferase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRINTS; PRO0476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     pukaryota; Entamoebidae;
NCBI_TaxID=5759;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PPi-dependent phosphofructo-1-kinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Entamoeba histolytica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 j=4
j∰s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     196
                                                                                                                                                                                                                                                                                                                                                                                          384
                                                                                                                                                                                                                                                                                                                                                                                                                                              288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             91
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                          SG-VIGHDEDN 393
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYFMNVVAB
                                                                                                                                                                                                                                                                                                                                                                                                                                              SINYLRDSITKYLKSIGIEEHTIKFVDPSYMIRSAPCSAADAHFCMCLANAAVHVAMAGK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AVNPGKWFGEQFAQMIGAEKTLVQ--KSGYFARASASNVDDMRLIKSCADLAVECAFRRE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IPITQICEFVGKR---IMSKGHVV-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDL----EAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHI-KLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AKSAKNGIGIVRLWGRDAGFIAL----YASLANG------DANLVLIPEID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DGTLRGANAINKELRRRKVPITVVGIPKTIDNDICYTDSTFGFQTAVGLSQEAINAVHSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KKAGVLQRPGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KVAIVTCGGLCPGLNNVIRGLVLNLYNRYHVN-NIFGLRWGYEGLVPELSEVQRLTPEI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KVAILTAGGLAPCLNSAI-GSLIERYTEIDPSIBIICYRGGYKGLL--LGDSYPVTABVR
                                                                                                                                                                                                                                                                                                                                         TGLVI CHHHNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --VSDIHQKGGSILGTSR
                                                                                                  (TrEMBLrel.) (TrEMBLrel.) (TrEMBLrel.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        382 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (TremBirel. 01, Created)
(TremBirel. 01, Last sequence update)
(TremBirel. 23, Last annotation update)
TremSirel. 23, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                            PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        41747 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      11.4%; 26.7%;
                                                                                                    13,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Entamoeba
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                63;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 260; DB 5;
Pred. No. 5.5e-11;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        7ECCE8F37CD4F87B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches 149;
                                                                                                                                                                                                               500
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                382
  Embryophyta;
                                                                                                                                                                                                            3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B
                                                                                                       update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GAQSPEVMAQFLIDNNFNILFTLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -LQNQKPKDLDLGTDKSGNILHWD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              287
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      210
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            135
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              94
```

```
S
                                               문
                                                                  δ
                                                                                              밁
                                                                                                                     δ
                                                                                                                                                8
                                                                                                                                                                       Ś
                                                                                                                                                                                                   밁
                                                                                                                                                                                                                      Ş
                                                                                                                                                                                                                                                    문
                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                        몺
                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam; PF00365; PFK; 1.
PRINTS; PR00476; PHFRCTKINASE.
ProDom; PD000707; Ppfruckinase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EV Arabidopsis sequencing project;
Submitted (MAR-2000) to the EMBL/GenBank/DDBJ
EMBL; AL049171; CAB38956.1; -.
EMBL; AL161564; CAB79482.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A. Rose M., Hempel S., Submitted (MAR-2000)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Kinase.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bevan M., Koetter
Mewes H.W., Mayer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Spermatophyta; Magnoliophyta; eudicotyledons; core eudicots; Rosidae; eurosids II; Brassicales; Brassicaceae; Arabidopsis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR000023; Ppfruckinase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HSSP; P00512; 3PFK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Arabidopsis sequencing project;
omitted (MAR-1999) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                             199
                                                                                                                                                                                                                                                     189
                                                                                                                                                                                                                                                                                                       149
455
                      423
                                                401
                                                                       368
                                                                                                                                                   290
                                                                                                                                                                           259
                                                                                                                                                                                                                                                                                                                                                                                                          109;
                                                                                                                                                                                                                                                                                                                                                                                 37
                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FROM N.A.
SSTNQP
                      SEIGOP
                                                CTLLAQSAVHGAMAGYTGYI ---
                                                                        IKSCADLAVECAFRRESGVIGHDEDNGNV---LRAIEFPRIKGGKPFNIDTD--WFNSML
                                                                                                                         QEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVO----KSGYFARASASNVDDMRL
                                                                                                                                                 RDVDCCLIPESPFYLEGEGGLFEYIEKRLKESGHMV----LVIAEGAGQDLMSKSMESM-
                                                                                                                                                                                                     EAGRAINAAHVEAESIENGIGVVKLMGRYSGFIA----
                                                                                                                                                                                                                            QGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRES
                                                                                                                                                                                                                                                    DRGINQVYIIGGDGTQRGASVIFEEIRRRGLKVAVIGIPKTIDNDIPVIDKSFGFDTAVE
                                                                                                                                                                                                                                                                            KDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAB
                                                                                                                                                                                                                                                                                                      AKNTVSLDSKV---VNDIHKRÖGTILGTSR-------GGHDTTKI-VDSIQ
                                                                                                                                                                                                                                                                                                                              LGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLV
                                                                                                                                                                          YEVHAVPVPEMAIDLEAEA------KRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKG
                                                                                                                                                                                                                                                                                                                                                        IVTCGGLCPGLNTVIREIVSSLSYMYGVKRILGIDVS---PCDCNLLLTKTNTGGYRGFY
                                                                                                                                                                                                                                                                                                                                                                               ILTAGGLAPCLNSAIGSL-----IERYTEIDPSIBIIC-----YRGGYKGLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (MAR-1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            500 AA;
                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
460
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              χ.
Τ.
                                                                                                                                                                                                                                                                                                                                                                                                                                                            55295 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Entian K.-D., Mewes H.W., to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                     11.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hempel S., Entian X., Schueller C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                          59
                                                                                                  GLWLSQSIKDHFNQKKWVMNLKYIDFTYMIRAVPSNASDNVY
                                                                                                                                                                                                                                                                                                                                                                                                                     Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                               Score 257.5;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            A09DFD850C905087 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                -SGLVNGRQTYIPFYRITEKQNHVVITDRMWAR-LL
                                                                                                                                                                                                                                                                                                                                                                                                                       ö
                                                                                                                                                                                                                                                                                                                                                                                                                      1.3e-10;
                                                                                                                                                                                                                                                                                                                                                                                                                                  DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                        167;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Lemcke K.,
databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  databases
                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                  Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mayer K.F
                                                                                                                                                                                                                                                                                                                                                                                                                                   500;
                                                                                                                                                                                                                                                                                                                                                                                                        91;
                                                                                                                                                                                                      MYATLAS
                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                         148
                                                                                                                            367
                                                                                                                                                                                                                                                       248
                                                                                                                                                                                                                                                                                198
                                                                                                                                                                                                                                                                                                         188
                                                   454
                                                                                                   400
                                                                                                                                                                                                      289
                                                                                                                                                                                                                                                                                                                                                                                 78
```

Search completed: January 29, 2004, 14:37:55 Job time : 43 secs

()

```
Result
No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Database
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Minimum DB
Maximum DB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Perfect score:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Run on:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OM protein - protein search, using sw
                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
 Score
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               seq length: 0
seq length: 2000000000
                                                                                                                                                                                                                                                                           Query
Match
                                  100.0
100.0
100.0
100.0
128.9
123.9
12.5
11.8
11.8
                                                                                                                                                                                                                                                                                                                                                                                                                                   10:
12:
13:
14:
15:
16:
17:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        January 29, 2004, 14:37:58; Search time 39 Seconds (without alignments) 2328.695 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           BLOSUM62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-941-947A-2
2284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    789580 seqs, 207824079 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 DVVTWPYHLTADIRFCHWFF.....FNSMLSEIGQPKGGKVEVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Published_Applications
                                                                                                                                                                                                                                                                                                                                                                                                                      / cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US08_PUBCOMB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US08_PUBCOMB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US09A_PUBCOMB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US09A_PUBCOMB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US09_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_PUBCOMB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
/ cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GenCore version 5.1.6 Copyright (c) 1993 - 2004 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         /cgn2_6/ptodata/1/pubpaa/US07_PUBCOMB.pep:*
                                                                                                                                                                                                                                                                            Length
                                                                                                                                                                                                                                                                            멂
              US-09-934-901-16
US-09-934-868-6
US-09-941-947A-2
US-10-320-874-16
US-10-320-874-16
US-10-369-493-1434
US-10-369-493-1810
US-10-156-761-13610
US-10-156-761-13620
US-10-156-761-10359
US-10-156-761-10359
US-10-369-493-19261
US-10-369-493-2669
US-10-369-493-2669
US-10-369-493-2669
US-10-369-493-2669
                                                                                                                                                                                                                                                                            ij
                                                                                                                                                                                                                                                                                                                             SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                mode1
                                                                                                                                                                                                                                                                           Description
 Sequence
                                                                                                                                                   Sequence 2,
Sequence 16,
Sequence 16,
Sequence 143
              Sequence
Sequence
Sequence
Sequence
Sequence
                                                                                                  Sequence
Sequence
Sequence
                                                                                                                                                                                                    Sequence 16, Appli
Sequence 6, Appli
Sequence 2, Appli
16, Appl
14348, Appl
14348, Ap
13610, Ap
13610, A
10359, A
10261, Ap
2905, Ap
2905, Ap
21998, A
13785, A
 13785
```

υ U	44	43	42	41	40	39	38	37	36	35	34	LJ LJ	32	34	30	29	28	27	9	25	24	23	22	21	20	19	18	17	16
193	196	196	198	200	201	201	201	2	202.5	207	213	213.5	215	218.5	221	222	222	•	222.5		•								٠
ب ق	æ.6	89. G	8.7	8.8	8.8	8.8	8.8	8.8	8.9	9.1	9.3	9.3	9.4	9.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.8	9,8	9.9	0	0	0	10.4	10.5
942	8 2 8	321	419	776	357	343	343	361	321	959	321	321	321	320	335	340	322	360	322	322	322	319	334	320	449	295	320	320	318
12	12	12	2	5	10	15	ø	12	9	12	12	12	12		φ		12	12	9	9	ø	12	12	φ	2	12	12	9	12
9-493-24	-369-493-673	-369-493-10	-369-493-291	05-342-	738-626-	US-10-098-626-2	US-09-887-054-2	69-493-262	\vdash	69-493-190	69-493-47	-69	0-36	09-815-242-1064	9-815-	US-10-369-493-18431	10-369	US-10-369-493-19198				10-36	-10-36	-815-242-1172	US-10-369-493-8876	-10-369-493-885	9-493-236	09-815	US-10-369-493-9652
	w	Sequence 10434, A	29			Sequence 2, Appli	N	æ	11162,	Sequence 1903, Ap	479,	128,	Sequence 21210, A	Sequence 10649, A	Sequence 13346, A	e 18431,	Sequence 10132, A	Sequence 19198, A	Φ	1261	5425,	17399		11721,	8876,	e 8855, į	መ	10422,	Sequence 9652, Ap

ALIGNMENTS

180	QY 121 GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV	
120	Db 61 IDPSIBIICYROGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR	
120	Qy 61 IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR	
60	Db 1 DVVTWPYHLTADIRFCHWFFILNFNFYTLM%KPKKVAILTAGGLAPCLNSAIGSLIERYTE	
60	QY 1 DVVTWPYHLTADIRFCHWFFILMNKFYTLMNKFKKVAILTAGGLAFCLNSAIGSLIERYTE	
0,	Query Match 100.0%; Score 2284; DB 10; Length 437; Best Local Similarity 100.0%; Pred. No. 1.4e-223; Matches 437; Conservative 0; Mismatches 0; Indels 0; Gaps	
	; OKGANISM: METHYLOMONAS SP. US-09-934-901-16	
	TYPE: PRI	
	SEQ ID NO 16	
	; NUMBER OF SEQ 1D NOS: 20 ; SOFTWARE: Microsoft Office 97	
	; PRIOR FILING DATE: September 1, 2000	
	PPLICATION NUMB	
	; CURRENT APPLICATION NUMBER: US/09/934,901	
	REFERENCE: CL1619 US NA	
	; FITLE OF INVENTION: DENITRIFYING METHANOTROPHIC BACTERIAL STRAIN	
	; APPLICANT: Koffas, Mattheos	
	; Patent No. US20020110885A1 : GENERAL INFORMATION:	
	; Sequence 16, Application US/09934901	
	US-09-934-901-16	

```
FILE REFERENCE: CLISS US NA / 9794,868
CURRENT FILING DATE: 2001-08-22
PRIOR APPLICATION NUMBER: US/09/934,868
CURRENT FILING DATE: 2000-08-22
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR FILING DATE: 2000-09-01
NUMBER OF SEQ ID NOS: 81
SOFTWARE: Microsoft Office 97
SEQ ID NO 6
LENGTH: 437
Ś
                               밁
                                                          Ş
                                                                                             맒
                                                                                                                       Q
                                                                                                                                                          맑
                                                                                                                                                                                      S
                                                                                                                                                                                                                      B
                                                                                                                                                                                                                                                   Ş
                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                 B
                                                                                                                                                                                                                                                                                                                                                                            S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESULT 2
US-09-934-868-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       g
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence 6, Application US/09934868
Fatent No. US20020137190A1
GENERAL INFORMATION:
APPLICANT: KOLIAS, Mattheos
APPLICANT: Odom, James M
APPLICANT: Schenzle, Andreas J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -09-934-868-6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Schenzle, Andreas J
TITLE OF INVENTION: DENITRIFYING METHANOTROPHIC BACTERIAL STRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TYPE: PRT
ORGANISM: METHYLOMONAS SP
                                                                                             241
                                                                                                                          241
                                                                                                                                                          181
                                 301
                                                              301
                                                                                                                                                                                        181
                                                                                                                                                                                                                      121
                                                                                                                                                                                                                                                     121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             361
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      181
                                                                                                                                                                                                                                                                                      61
                                                                                                                                                                                                                                                                                                                                                                                                               al Similarity
437; Conserv
                                                                                                                                                                                                                                                                                                                   61
                               DVVTWPYHLTADIRFCSWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
   NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                            DNDVFPIKQSIGAWTAAEQGARYFWNVVAENNANPRMLIVHEVWGRNCGWLTAATAQEYR
                                                                                                                                                                                DNDVFPIKQSLGAWTAAEQGARYFWNVVAENNANPRMLIVHEVWGRNCGWLTAATAQEYR
                                                                                                                                                                                                                      GLVXEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                          IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                  DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFKS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFFRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DNDVFFIKQSLGAWTAAEQGARYEMNVVAENNANPRKLIVHEVMGRNCGWLTAATAQEYR
                                                                                             KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                    IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KLIDRAEWIPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 XILDRAEWIPELGHTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ONDVFP1KQSLGAWTAAEQGARYFMNVVAENNANPRKLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                             100.0%; Score 2284; DB 10; ilarity 100.0%; Pred. No. 1.4e-223; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 10;
                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 437;
                                                                                                                                                                                                                                                                                                                                                                                                               0
                                                              360
                                                                                                                            300
                                                                                                                                                                                                                                                      180
                                                                                                                                                                                        240
                                                                                                                                                                                                                                                                                                                   120
                                 360
                                                                                             300
                                                                                                                                                            240
                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                  60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           420
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    240
                                                                                                                                                                                                                                                                                                                                                                                                               0
```

```
Q
                                                                                              Ś
                                                                                                                                    밁
                                                                                                                                                                  5
                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                          Ş
                                                                                                                                                                                                                                                                                                                                             g
                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                  밁
                                                                                                                                                                                                                                                                                                                                                                                                                                               Ş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-09-941-947A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
APPLICANT: Brzostowicz, P
APPLICANT: Cheng, Qiong
APPLICANT: DiCosimo, Dea
APPLICANT: Koffas, Watth
APPLICANT: Miller, Edwar
APPLICANT: Odom, J. Mart
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 3
US-09-941-947A-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            욹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: ROUVIETE, PIETRE E.

TITLE OF INVENTION: CAROTENDID PRODUCTION FROM A SINGLE CARBON SOURCE
FILE REFERENCE: CL1903 US NA
CURRENT APPLICATION NUMBER: US/09/941,947A
CURRENT FILING DATE: 2001-09-01
PRIOR APPLICATION NUMBER: 60/229,907
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR APPLICATION NUMBER: 60/229,858
PRIOR FILING DATE: 2000-09-01
NUMBER OF SEQ ID NOS: 60
SOFTWARE: Microsoft Office 97
SEQ ID NO 2
SEQ ID NO 2
SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Best Loc
Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 2, Application US/09941947A Publication No. US20030003528A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 437
TYPE: PRT
ORGANISM: Methylomonas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Local Similarity
nes 437; Conserv
421
                               421
                                                                  361
                                                                                                 361
                                                                                                                                      301
                                                                                                                                                                       301
                                                                                                                                                                                                         241
                                                                                                                                                                                                                                            241
                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                                                                                                                                                121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         421
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            361
                                                                                                                                                                                                                                                                                                                                                                                                                   5
                                                                                                                                                                                                                                                                                                                                                                                                                                                     13
MLSEIGOPKGGKVEVSH
                                                                                      NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                      MLSEIGQPKGGKVEVSH
                                                                                                                                                       EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                               KLLDRAEWLPELGLTRESYBVHAVFVPEMALDLEARAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                   DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                    GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                   IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                      IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DVVTWPYHLTADIRFCHWFFLNFNFYTLANKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                  NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                         KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                               GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DVVTWPYHLTADIRFCHWFFLNENFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MLSBIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MLSEIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Cheng, Qiong
DiCosimo, Deana J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Picataggio, Steve
Rouviere, Pierre E.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Odom, J. Martin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      100.0%; Score 2284; DB 11; ilarity 100.0%; Pred. No. 1.4e-223; Conservative 0; Kismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Edward S. Jr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mattheos
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Patricia
437
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                  180
                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                       420
                                                                                                                                                                         360
                                                                                                                                                                                                          300
                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                   120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                420
                                                                       420
                                                                                                                                        360
                                                                                                                                                                                                                                                                               240
```

```
Sequence 16, Application variable Sequence 16, Application No. US20030138909A1

Fublication No. US20030138909A1

GENERAL INFORMATION:

APPLICANT: KOffes, Mattheos

APPLICANT: No. US20030138909A1ton, Kelley C.

APPLICANT: Ye, Rick

TITLE OF INVENTION: DENITRIFYING METHANOTROPHIC BACTERIAL STRAIN

FILE REFERENCE: CL1619 US NA

CURRENT APPLICATION NUMBER: US/10/320,874

CURRENT FILING DATE: 2002-12-17

PRIOR APPLICATION NUMBER: US/99/934,901

PRIOR FILING DATE: September 1, 2000

NTMMERR OF SEQ ID NOS: 20
          RESULT 5
US-10-320-924-16
Sequence 16, Application US/10320924
Publication No. US20030129721A1
GENERAL INFORMATION:
APPLICANT: Koffas, Mattheos
APPLICANT: No. US20030129721A1ton, Kelley C.
APPLICANT: Ye, Rick
                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                        S
                                                                                                                                                                                                                                                                                                                        뫄
                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                             맑
                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                             문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              뮸
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; TYPE: PRT ; ORGANISM: METHYLOMONAS US-10-320-874-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US-10-320-874-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ENGTH: 437
                                                                                                                                                                                                421
                                                                                                                                                                                                                             421
                                                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                               301
                                                                                                                                                                                                                                                                                                                                                              301
                                                                                                                                                                                                                                                                                                                                                                                                                                                               181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121
                                                                                                                                                                                                                                                              361
                                                                                                                                                                                                                                                                                                                                                                                             241
                                                                                                                                                                                                                                                                                                                                                                                                                              241
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              μ,
INVENTION: DENITRIFYING METHANOTROPHIC
                                                                                                                                                                                                                 MLSBIGQPKGGKVEVSH 437
                                                                                                                                                                                                                                                                              NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                                                EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                          KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DNDVEPIKQSLGAWTAAEQGARYFMVVVAENNAVPRHLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLAANNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IDPSIBIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTMVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DVVTWPYHLTADIRFCHWFFLNENFYTLMNKPKKVAILTAGGLAPCINSAIGSLIERYTE
                                                                                                                                                                                                                                                             NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                           EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                             KLIDRAEWIPEIGITRESYEVHAVFVPEMAIDLEAEAKRIREVMDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                           DNDVFPTKQSLGAWTAAEQGARYFMNVVAENNANPRMLTVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                           MLSEIGOPKGGKVEVSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          100.0%; Score 2284; DB 12; 100.0%; Pred. No. 1.4e-223;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              qş
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                               O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DB 12;
BACTERIAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            <u>.</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length
STRAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ò
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                             420
                                                                                                                                                                                                                                                                                            420
                                                                                                                                                                                                                                                                                                                             360
                                                                                                                                                                                                                                                                                                                                                            360
                                                                                                                                                                                                                                                                                                                                                                                                                            300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                             300
                                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0
```

```
CURRENT APPLICATION NUMBER: US/10/320,924
CURRENT FILING DATE: 2002-12-17
PRIOR APPLICATION NUMBER: US/09/934,901
PRIOR FILING DATE: 2001-08-22
PRIOR APPLICATION NUMBER: 60/229,906
PRIOR FILING DATE: September 1, 2000
NUMBER OF SEQ ID NOS: 20
SOFTWARE: Microsoft Office 97
SBQ ID NO 16
                                                                                                                         문
                                                                                                                                                      S
                                                                                                                                                                                                                    Ş
                                                                                                                                                                                                                                                     밁
                                                                                                                                                                                                                                                                                   S
                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                 밁
                                                                                                                                                                                                                                                                                                                                                                                                          Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                             밇
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ś
RESULT 6
US-10-369-493-14348
                                                                                        S
                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ; ORGANISM: METHYLOMONAS
US-10-320-924-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches 437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILE REFERENCE: CL1619 US NA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LENGTH: 437
                                                                                                                                                                                                                       301
                                                                                           421
                                                                                                                         361
                                                                                                                                                        361
                                                                                                                                                                                         301
                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                     241
                                                                                                                                                                                                                                                                                                                 181
                                                               421
                                                                                                                                                                                                                                                                                                                                                 181
                                                                                                                                                                                                                                                                                                                                                                                 121
                                                                                                                                                                                                                                                                                                                                                                                                     121 GLYKEGEDPQKYAADQLYKDGYDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                               61 IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 DVVTWPYHLTADIRFCHWFFLNFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIBRYTE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                 NVDDMRLIKSCADLAVECAFRRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                                                                                                                 DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                      KLIDRAEWI PELGITRESYEVHAVFVPEMAIDI EAEAKRI REVMDKVDCVNI FVSEGAGV
                                                                                                                                                                                                                                                                                                                                     DNDVFPIKQSLGAWTAAEQGARYFMNVVAENNANPRMLIVHEVMGRNCGWLTAATAQEYR
                                                                                                                                                                                                                                                                                                                                                                                 GLVKEGEDPQKVAADQLVKDGVDILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTV
                                                                                     MLSEIGQPKGGKVEVSH 437
                                                                                                                           NVDDMRLIKSCADLAVBCAFRRESGVIGHDEDNGNVLRAIBFPRIKGGKPFNIDTDWFNS
                                                                                                                                                                                                                         EAIVAEMQAKGQEVPRDAPGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DVVTWPYHLTADIRFCHWFFLMFNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIBRYTE
                                                               MLSEIGQPKGGKVEVSH
                                                                                                                                                                                         EAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASAS
                                                                                                                                                                                                                                                        KLLDRAEWLPELGLTRESYEVHAVFVPEMAIDLBAEAKRLREVWDKVDCVNIFVSEGAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                               IDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    100.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       qs
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 2284; DB 16;
Pred. No. 1.4e-223;
); Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DB 16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          437;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                180
                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                 180
                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              120
                                                                                                                           420
                                                                                                                                                           420
                                                                                                                                                                                         360
                                                                                                                                                                                                                         360
                                                                                                                                                                                                                                                       300
                                                                                                                                                                                                                                                                                     300
                                                                                                                                                                                                                                                                                                                                                 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0
```

APPLICANT: Cao, Yongwei
APPLICANT: Hinkle, Gregory J.
APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeng
ITITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS IN PLANTS FOR PRODUCTION
ITITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES
FILE REFERENCE: 38-10(52052)B
CURRENT APPLICATION NUMBER: US/10/369,493
CURRENT FILING DATE: 2003-02-28
PRIOR APPLICATION NUMBER: US 60/360,039
PRIOR PILING DATE: 2002-02-21
NUMBER OF SEQ ID NOS: 47374
SEQ ID NO 14348
LENGTH: 184
TYPE: PRT

ဝှု

Sequence 14348, Application US/10369493 Publication No. US20030233675A1 GENERAL INFORMATION:

```
Ş
                                    g
                                                                      Ś
                                                                                                              ď
                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; TYPE: PRT; ORGANISM: Thermobifida fusca US-10-369-493-8108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RESULT 7
US-10-369-493-8108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ď.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               8
                                                                                                                                                                                        よ
                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                             용
                                                                                                                                                                                                                                                                                                 Ś
                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Š
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         딹
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     γQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ; ORGANISM: Agrobacterium tumefaciens US-10-369-493-14348
                                                                                                                                                                                                                                                                                                                                         よ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: US 60/360,039
PRIOR FILING DATE: 2002-02-21
NUMBER OF SEQ ID NCS: 47374
SEQ ID NO 8108
LENGTH: 350
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 8108, Application US/10369493 Publication No. US20030233675A1 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match 28.9
Best Local Similarity 67.9
Matches 125; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Simi
Matches 104;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Cao, Yongwei
APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS IN PLANTS FOR PRODUCTION TITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES FILE REFERENCE: 38-10 (52052)B CURRENT APPLICATION NUMBER: US/10/369,493 CURRENT FILLING DATE: 2003-02-28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
                                        196
                                                                          258
                                                                                                                158
                                                                                                                                                  203
                                                                                                                                                                                        104
                                                                                                                                                                                                                           143
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           153
                                                                                                                                                                                                                                                               59
                                                                                                                                                                                                                                                                                                   83
                                                                                                                                                                                                                                                                                                                                                                             23 FNFYTLMNKPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGLLLGDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ب
                                                                        SYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRD
                                                                                                                AIDRLHTTAESHHRALVV-BVMGRHAGWIALHAGMAAGA-------
                                                                                                                                                YFMNVVAENNANPRMLIVHEVMGRNCGWLT----AATAQEYRKLLDRAEWLPELGLTRE 257
                                                                                                                                                                                        DALVAIGGEDTLGVARQL-----HDHGVNVVGVPKTIDNDLNATDYTFGFDTAVNIATE
                                                                                                                                                                                                               DILHTIGGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWTAAEQGAR
                                                                                                                                                                                                                                                                 MPLDIEAVR--GILPR-GGTILGSSRTNLMKIEGGVER---
                                                                                                                                                                                                                                                                                                   YPVTAEVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGV 142
                                                                                                                                                                                                                                                                                                                                         FKEYTOM----RVGVLTGGGDCPGLNAVIRAVVRKGIK-EYGYEFVGFRDGWRGPLEGDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAPK 184
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ANPR 216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      THTTAADLAAYLGANGYDLTVVGLPKTVDNDVVPIKQSLGAWTAAEVGAAFFDNVSNEQS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TNTAAADLAAFLARNYGLTVIGLPKTVDNDVFPIKQSLGAWTAASQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AHLLHRYGGSPIGNSRVKLTNAADCAKRGLVKEGDNPLRVAAERLAADGITILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD 152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKS----GYFARASASNVDDMRLIKSCADL
                                      ----NVILIPERPFDIDEVVAYIESRFKTNYAPIIVVAEGAHPK----EGQLTLASAERD
                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                               13.4%; Score 306.5; DB 12; 26.5%; Pred. No. 2.2e-22; tive 63; Mismatches 145;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  28.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 659; DB 12;
Pred. No. 1.1e-58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 184;
                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                               ----VKDNMAALGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                          350;
                                                                                                                                                                                                                                                                                                                                                                                                                   8 E ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                        247
                                                                            317
                                                                                                                195
                                                                                                                                                                                                                                                                 103
                                                                                                                                                                                                                                                                                                                                           58
                                                                                                                                                                                                                                                                                                                                                                             82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                     14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FILE REFERENCE: 249-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2002-05-29
PRIOR APPLICATION NUMBER: JP 2001-204089
PRIOR APPLICATION NUMBER: JP 2001-204089
PRIOR FILING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR FILING DATE: 2001-08-02
NUMBER OF SEQ ID NOS: 15109
SEQ ID NO 13610
LENGTH: 342
    RESULT 9
US-10-156-761-14652
; Sequence 14652, Application US/10156761
; Publication No. US20030119018A1
; GENERAL INFORMATION:
                                                                                                                                                                    δ
                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                         Ś
                                                                                                                                                                                                                                                                                   片
                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                               Ŗ
                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                        몆
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ř
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     묽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Streptomyces avermitilis US-10-156-761-13610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         RESULT 8
US-10-156-761-13610
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 13610, Application US/10156761
Publication No. US20030119018A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SAKAKI, YOSHIYUKI
APPLICANT: HATTORI, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: OMURA, SATOSHI APPLICANT: IKEDA, HARUO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local Similarity
                                                                                                                                                                                                                                                                                       198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              248
                                                                                                                                                                                                            250
                                                                                                                                                                                                                                                 328
                                                                                                                                                                                                                                                                                                                         272
                                                                                                                                                                                                                                                                                                                                                               161
                                                                                                                                                                                                                                                                                                                                                                                                                                      106 LGVAARLT-----DEYGVPVVGVPKTIDNDLSATDYTFGFDTAVGIATEAIDRLHTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  154 NTAAADLAAFLARNNYGLTVIGLEKTVONDVFFIKQSLGAWTAAEQGARYF--MNVVAEN 211
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     101;
                                                                                                                                                                                                                                                                                                                                                                                                 212 NANPRMLIVHEVMGRNCGWLTAATAQEYRKILDRAEWLPELGLTRESYEVHAVFVPEMÄI 271
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  59 GILPR-GGTILGSSRTNPLKLDDGIRR--IKE------NLAKQEVDALIAIGGEDT 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            34 KVAILTAGGLAPCINSAIGSLIERYTEIDPSIEIICYRGGYKGLLIGDSYPVTAEVRKKA 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N
                                                                                                                                                                                                                                             NPGKWFGEQFAQMIGAS-KTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGV 386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RVGVLTGGGDCPGLNAVIRGVVRKGVQ-EYGYDFVGFRDGWRGPLEGDA--VRLDIPAVR 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AVECAFRESGVIGHDEDNGNV--LRAIEFPRI 405
                                                                                                                                      --RDGDFGKMVALRGTDIVRV
                                                                                                                                                                        IGHDEDNGNV--LRAIEFPRI 405
                                                                                                                                                                                                                                                                                     DVDQVCAYVTSRFKASYAPIVVVABGA----
                                                                                                                                                                                                                                                                                                                       DIEAEAKRIREVMDKVDCVNIFVSBGAGVEAIVAEMQAKGQEVPR----DAFGHIKLDAV 327
                                                                                                                                                                                                                                                                                                                                                             HMR---VLVCEVMGRHAGWIAIHS-------GLAGGA---NVILIPBORF 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SFGHVRLGGI-----GQRLAEEIEARTGKEARSVVLGHVQRGGTPSAFDRVLATRLGLH
                                                                                                                                                                                                            --GEWLAKBIEKRTGKEARTTV--LGHVQRGGTPSAFDRWLATRFGLHAIEAV---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IKEDA, HARUO
ISHIKAWA, JUN
HORIKAWA, HIROSHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ::
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12.9%; Score 294; DB 15; Length 342; 26.5%; Pred. No. 4e-21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HDKDFGKMVALRGTBIVRV 325
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Mismatches 140;
```

Indels

74;

Сарв

17;

-MPKDGQMVLKDESLDSFGHVRLSGV 249

160

```
RESULT 10
US-10-156-761-10359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 핝
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      융
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; ORGANISM: Streptomyces avermitilis US-10-156-761-14652
                                                                                                                                                                                                                                                                                                                                                              GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                Sequence 10359, Application US/10156761
Publication No. US20030119018A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQ ID NO 14652
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match
PRIOR APPLICATION NUMBER: JP 2001-204089
PRIOR FILING DATE: 2001-05-30
PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR FILING DATE: 2001-08-02
NUMBER OF SEQ ID NOS: 15109
SEQ ID NO 10359
                                                                                                                    PILE REFERENCE: 249-262
CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2002-05-29
                                                                                                                                                                                 APPLICANT: ISHIKAWA, JUN
APPLICANT: HORIKAWA, HIROSHI
APPLICANT: SHIBA, TADAYOSHI
APPLICANT: SAKAKI, YOSHIYUKI
APPLICANT: HATTORI, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
                                                                                                                                                                                                                                                                                               APPLICANT: OMURA, SATOSHI
APPLICANT: IKEDA, HARUO
APPLICANT: ISHIKAWA, JUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: JP 2001-272697
PRIOR FILING DATE: 2001-08-02
NUMBER OF SEQ ID NOS: 15109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CURRENT APPLICATION NUMBER: US/10/156,761
CURRENT FILING DATE: 2002-05-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: SHEA, TADAYOSHI
APPLICANT: SAKAKI, YOSHIYUKI
APPLICANT: HATTORI, MASAHIRA
TITLE OF INVENTION: NOVEL POLYNUCLEOTIDES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: JP 2001-204089
PRIOR FILING DATE: 2001-05-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 341
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pocar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         903
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            214 NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMALDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  154 NTAAADLAAFLARNNYGLTVIGLEKTVDNDVFFIKQSLGAWTAABQGARYFMNVVAENNA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                94 GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              l Similarity
97; Conserva
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LSIELEERIGKEARPV-ILGHVQRGGTPTAYDRVLATRFGWHAVEAVHRGEFG 304
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESG 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HQRVLIV-EVMGRHTGWIALHSGM--------AAGAHAIVVPERPFDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GILAR-GGTILGSSRVQPAHLRDGVER-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RIGVLTSGGDCPGLNAVIRSVVHR-AVVDHGDEVIGFRDGWKGLLECDY--LKLDLDAVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ESLAAKVGERFEAGKRFAIVVAAEGAKPRAGSMDF----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EAEAKRIREVMDKVDCVNIFV-SEGAGVBAIVAEMQAKGQEVPRDAFGHIKLDAVNPGKW 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              OMURA, SATOSHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ISHIKAWA, JUN
HORIKAWA, HIROSHI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HARUO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2002-05-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         12.5%; Score 284.5; DB 15; Length 341; 27.5%; Pred. No. 3.7e-20; tive 62; Mismatches 143; Indels 51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---ARGHVAELGLDAIIPIGGEGT 105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -DEGKKDVYGHERFAGI--ARQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              51;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            273
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5
```

```
S
                                                                                 8
                                                                                                                        Ś
                                                                                                                                                                   B
                                                                                                                                                                                                          8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ; TYPE: PRT ; ORGANISM: Streptomyces avermitilis US-10-156-761-10359
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               묽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Q
                                                                                                                                                                                                                                                                                                                                         ; ORGANISM: Myxococcus xanthus
US-10-369-493-19261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   US-10-369-493-19261
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         F
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 S
                                                                                                                                                                                                                                                                                                                                                                                                  CURRENT APPLICATION NUMBER: US/10/369,493
CURRENT FILING DATE: 2002-02-28
PRIOR APPLICATION NUMBER: US 60/360,039
PRIOR FILING DATE: 2002-02-21
NUMBER OF SEQ ID NOS: 47374
SEQ ID NO 19261
LENGTH: 345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 19261, Application US/10369493
Publication No. US20030233675A1
GENERAL INFORMATION:
                                                                                                                                                                                                                                                                            Query Match
Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Cao, Yongwei
APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeng
TITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS
TITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES
FILE REFERENCE: 38-10 ($2052)8
                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 341
  102
                                      151 DDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAMTAABQGARYF--MNVV 208
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              329 PGKWFGEQFAQMIGAB-KTLVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRBSG 385
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  274 EAEAKRLREVMDK-----VDCVNIFYSEGAGVEAIVAEWQAKGQEVPRDAFGHIKLDAVN 328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      214 NPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAIDL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 106 LTAARML-----SDAGLPVVGVPKTIDNDISATDRTFGFDTAVGVATEAMDRLKTTAES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        154 NTAAADLAAFLARNNYGLTVIGLPKTVDNDVFFIKQSLGAWTAAEQGARYFMVVVAENNA 213
                                                                                                                             94 GVLQRFGGSVIGNSRV---KLTNVKDCVKRGLVKEGBDPQKVAADQLVKDGVDILHTIGG 150
                                                                                                                                                                                                            34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            94 GVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDDT 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   34 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            96;
                                                                                                                                                                      2 KVAVLTGGGDCPGLNAVIRAVVRRANA--HGFEMMGLRDGWKGLLEDNHFRLTRET--TS 57
                                                                                                                                                                                                                                                        96;
                                                                                                                                                                                                                                                     Similarity 26.0
96; Conservative
EGTLSAATRM-----SQEGLRIVGVPKTIDNDINATDFTFGFDTAVAIATEAIDRLHST 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AHLVKMVEERFARGKKFAVLC----VAEGA--HPVVGSMDYSHGAI--DQFGHERFQGI-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HQRVMVV-EVMGRHAGWIAL-------ESGMAAGA---HGICLPERPFDP 198
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GILAR-GGTILGSSRLQRDRLREACEN------AQDMAREFGIDALIPIGGEGT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RIGVITAGGDCPGLNAVIRSVVHRAVIWYGD-EVIGFEDGYAGLL--DGRYRALDLNAVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -GTALAAELEHRLGKEAKPVI --LGHIQRGGTPTAYDRVLATRFGWHAVEAAHRGDFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                     11.4%; Score 261; DB 12;
26.0%; Pred. No. 9.3e-18;
ative 66; Mismatches 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          59; Mismatches 142;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 269.5; DB 15;
Pred. No. 1.2e-18;
                                                                                                                                                                                                                                                                                              Length 345;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels 61;
                                                                                                                                                                                                                                                          Indels 66;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IN PLANTS FOR PRODUCTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 341;
                                                                                                                                                                                                                                                        Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       304
                                                                                      101
                                                                                                                                                                                                                 93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 159
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      105
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ő
```

```
RESULT 13
US-10-369-493-9669
                                                                                                                                                밁
                                                                                                                                                                                 Ş
                                                                                                                                                                                                                        엄
                                                                                                                                                                                                                                                   Ś
                                                                                                                                                                                                                                                                                            밁
                                                                                                                                                                                                                                                                                                                                                                   片
                                                                                                                                                                                                                                                                                                                                                                                                    S
                                                                                                                                                                                                                                                                                                                                                                                                                                             밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RESULT 12
US-10-369-493-2905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   닭
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                          Ď,
                                                                                                         S
                                                                                                                                                                                                                                                                                                                              δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             US-10-369-493-2905
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS IN PLANTS FOR PRODUCTION OF TITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES FILE REFERENCE: 38-10(52052)B CURRENT APPLICATION NUMBER: US/10/369,493 CURRENT APPLICATION NUMBER: US/10/369,493 CURRENT FILING DATE: 2003-02-28 PRIOR APPLICATION NUMBER: US 60/360,039 PRIOR APPLICATION NUMBER: US 60/360,039 PRIOR FILING DATE: 2002-02-21 NUMBER OF SEQ ID NO 2905
SEQ ID NO 2905
LENGTH: 319
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 2905, Application US/10369493 Publication No. US20030233675A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Cao,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TYPE: PRT ORGANISM: Thermotoga maritima
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                           331
                                                                                                                                                199
                                                                                                                                                                                   273
                                                                                                                                                                                                                        160
                                                                                                                                                                                                                                                         213 ANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFVPEMAID 272
                                                                                                                                                                                                                                                                                              105
                                                                                                                                                                                                                                                                                                                                  153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               382
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   156
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        209
                                                                                                                                                                                                                                                                                                                                                                     58
                                                                                                                                                                                                                                                                                                                                                                                                        93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                33 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKK 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   95;
                                                                                                                                                                                                                                                                                                                                                                                                                                               N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                     AGITEK-GGTILRTSRCEEFKT---
                                                                                                                                                                                                                                                                                            SLT----GAHLLYEEHKI PVVGI PATIONDIGLTDXCIGVDTCLNTVMDAVQKLKDTAS
                                                                                                                                                                                                                                                                                                                              TNTAAADLAAFLARNKYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYFMNVVAENN
                                                                                                                                                                                                                                                                                                                                                                                                        AGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTIGGDD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KMAALRGND 316
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RESCVICED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IPADLAKVÁEHIQRRHAGGRTFSI-VVVÁEGTRIKLSADQQEQLVTSGALDEAGRPRLGG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MAIDLEAEAKRL--REVMDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AESH---KRVIVCEVMGRHVGWIAT----YAGIAGGAD------VILVPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ABNNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVEVPB
                                                                                                                                                                                                                                                                                                                                                                                                                                             KKIAVLTSGGDAPGMNAAVRAVV-RY-GVRQGLEVIGVRRGYSGLIDGDF--VKLEYKDV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      V--GTILAHEIERRTGFE-TRVSVLGHIQRGGAPTAHDRVLATRYGVHAC-DMVARGEFG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRL----IKSCADLAVECAFR
                                                                                                           KWFGEQFAQMIGAEKTIVQKSGYFARASASNVDDMRLIKSCADLAVECAFRRESGVI 387
                                                                                                                                                YSQLADRILEERRRGKINSI-IIVAEGAASAYTVAR--
                                                                                                                                                                                   LEAEAKRIREV--MDKVDCVNIFVSEGAGVEAIVAEMQAKGQEVPRDAFGHIKLDAVNPG
                                                                                                                                                                                                                        SHERAFİV-EVMGRHSGYIALMAG-----LVTGAE-------AIIVPEIPVD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        rongwei
                                                                          -YRIGYE-TRITILGHVQRGGSFTAFDRRLALSMGVEAVDALLDGEVDVM 284
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11.1%; Score 253; DB 12; 26.6%; Pred. No. 5.4e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches 126;
                                                                                                                                                                                                                                                                                                                                                                     BEGRELAAKQIKKHGIEGLVVIGGEG 104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 319;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                236
                                                                                                                                                                                     330
                                                                                                                                                                                                                          198
                                                                                                                                                                                                                                                                                              159
                                                                                                                                                                                                                                                                                                                                  212
                                                                                                                                                                                                                                                                                                                                                                                                          152
                                                                                                                                                                                                                                                                                                                                                                                                                                               57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      307
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                326
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        268
```

```
GENERAL INFORMALIANDE SERVICANT: Cao, Yongwei
APPLICANT: Hinkle, Gregory J.
APPLICANT: Slater, Steven C.
APPLICANT: Goldman, Barry S.
APPLICANT: Chen, Xianfeny
                                                                                                                                                                                                                                                                                                                 RESULT 14
US-10-369-493-21998
                                                                                                                                                                                                                                                                                                                                                                                                                                  Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         몱
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    片
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ŗ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               용
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              유
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ; TYPE: PRT ; ORGANISM: Desulfitobacterium hafniense US-10-369-493-9669
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TITLE OF INVENTION: EXPRESSION OF MICROBIAL PROTEINS
TITLE OF INVENTION: PLANTS WITH INPROVED PROPERTIES
FILE REFERENCE: 38-10(52052)
CURRENT APPLICATION NUMBER: US/10/369,493
CURRENT FILLING DATE: 2003-02-28
PRIOR APPLICATION NUMBER: US 60/360,039
PRIOR FILING DATE: 2002-02-21
NUMBER OF SEQ ID NOS: 47374
SEQ ID NO 9669
LENGTH: 357
                                                                                                                                                                                                                                                    Sequence 21998, Application US/10369493
Publication No. US20030233675A1
GENERAL INFORMATION:
                                                                                                                                                          APPLICANT: Cao,
APPLICANT: Hink
APPLICANT: Slat
APPLICANT: Gold
APPLICANT: Chen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches 101; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence 9669, Application US/10369493 Publication No. US20030233675A1
TITLE OF INVENTION: EXERESSION OF MICROBIAL PROTEINS TITLE OF INVENTION: PLANTS WITH IMPROVED PROPERTIES FILE REFERENCE: 38-10(52052)B
CURRENT APPLICATION NUMBER: US/10/369,493
CURRENT FILING DATS: 2003-02-28
PRIOR APPLICATION NUMBER: US 60/360,039
PRIOR PILING DATS: 2003-02-21
NUMBER OF SEQ ID NOS: 47374
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                      379
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   110
                                                                                                                                                                                                                                                                                                                                                                                                  307 ALAGDFGMM 315
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 322
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           201
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                267
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      164 TTAESH---HRIMILEVMGRYAGWIAL----YAGVAGGAD------VILI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            207 VVAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWLPELGLTRESYEVHAVFV 266
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         149
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ω
Δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      94 GVLQRFGGSVIG-----NSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHTI 148
                                                                                                                                                        Cao, Yongwei
Hinkle, Gregory J.
Slater, Steven C.
Goldman, Barry S.
Chen, Xianfeng
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GILPR-GGTILGTTWRDNPPAYPTQV-----GERQVQDRSAEVLDRFKAEGIDALIAI 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGDGSLSIAWEFA-----KQGLKVVGVPKTIDNDLMCTDLTFGFQTAVATAQDALDRLH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GGDDTNTAAADLAAFLARNNYGLTVIGLPKTVDNDVFPIKQSLGAWT--AAEQGARYFMN 206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVRKKA
                                                                                                                                                                                                                                                                                                                                                                                                                                      AFRRESCVI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PEMAIDLE--ABAKRLREVMDKVDCVNIFVSEGA---GVEAIVAEMQAKGQEVPRDAFGH 321
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLAILTGGGDCPGLNAVIRAAVK--TACHRGIAVVGIQDGFRGAVEGDFRPL--ELKDVS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IKLDAVNPGKWFGEQFA---OMIGAEKTLVOKSGYFARASASNVDDMRLIKSCADLAVEC 378
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IKLGGI---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PEIPYQLESIAEAVQRRARLGKHFSI-IVVAEGAKPLGGDMVV-ERTMSGRTDP-
                                                                                                                                                                                                                                                                                                                                                                                                                                      387
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ---GAKLAADLEKVTDMETRVTVLGHLQRGGSPIAVDRVLSTRYGVAAVEA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            11.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           63; Mismatches 136;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 250.5; DB 1
Pred. No. 1.1e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DB 12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
                                                                                                                                              ¥
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Z
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PLANTS
                                                                                                                                              PLANTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   357
                                                                                                                                              FOR PRODUCTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FOR PRODUCTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  . 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17
                                                                                                                                              õ
```

```
APPLICANT: Xu, H. Howard
APPLICANT: Xu, H. Howard
ITITLE OF INVENTION: Identification of Essential Genes in
FILE REFERENCES: ELITAR, 011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR FILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR APPLICATION NUMBER: 60/257,931
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RESULT 15
US-09-815-242-13785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   먉
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      몽
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              망
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          δ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         문
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ; SEQ ID NO 21998
; LENGTH: 987
; TYPE: PAT .
; ORGANISM: Saccharomyces cerevisiae
US-10-369-493-21998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 13785, Application US/09815242 Patent No. US20020061569A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT:
APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Haselbeck, Robert APPLICANT: Ohlsen, Kari L. APPLICANT: Zyskind, Judith W. APPLICANT: Wall, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        558 DKAISLRDTEF 568
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   513 AVLE----FTPETPSPLIGILENKIIRMPLVESVKLTKSVA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       346 TLVQKSGYFARASASN------VDDMRLIKSCADLAVECAFRRESGVIGHDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        418
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    257
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        458 LDDQLNPVTANDVKDALIEL---GLDTKVTILGHVQRGGTAVAHDRWLAT--LQGVDAVK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               244 DRABWLPELGLTRESYEVHAVFVPEMAIDLEAEAKRLREVMDKVDCV----NIFVSEGA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      304 VVCGGDGSLT-GADLFRHEWPSLVDELVAEGRFTKEEVAPYKNLSIVGLVGSIDNDMSGT 362
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            204 KKKKIAVMTSGGDSÞGNNAAVRAVVR--TGIHFGCDVFAVYEGYEGILRGGKÝ-----LK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     31 KPKKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIEIICYRGGYKGLLLGDSYPVTAEVR 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    h 10.8%; Score 246.5; DB 12; Length 987; Similarity 23.9%; Pred. No. 1.4e-15; 03; Conservative 68; Mismatches 135; Indels 125;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DNGNVLRAIEF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DSTIGAYSALERICEMVDYIDATAKSHSRAFVV-EVMGRHCGWLALMAGIATGADY----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HTIGGDDTNTAAADL-----AAFLARNNY-----GLTVIGLPKTVDNDVFPI 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KMAWEDVRGWLSE-GGTLIGTA-----RSMEFRKREGRRQAAGNLISQGIDAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KKA-----GVLQRFGGSVIGNSRVKLINVKDCVKRGLVKBGBDPQKVAADQLVKDGVDIL 145
                                                                                                                                                                                                                                                                                                                                                                                              Carr, Grant J.
Yamamoto, Robert T.
Xu, H. Howard
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Wall, Daniel
Trawick, John D.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ------ifiperavphgkwqdelkevcqrhrskgrrnntiivaega
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -GVEAIVAEMQAKGQEVPRDAFGHIKL--DAVNPGKWFGEQFAQMIGAEK 345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -TAIENKOF 557
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        512
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          243
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 303
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
```

```
ð
                                                                        멼
                                                                                                    S
                                                                                                                                         ₽
                                                                                                                                                                           Ś
                                                                                                                                                                                                              몽
                                                                                                                                                                                                                                              Ś
                                                                                                                                                                                                                                                                                   용
                                                                                                                                                                                                                                                                                                                  S
                                                                                                                                                                                                                                                                                                                                                      밁
                                                                                                                                                                                                                                                                                                                                                                                     Ś
                                                                                                                                                                                                                                                                                                                                                                                                                            맑
                                                                                                                                                                                                                                                                                                                                                                                                                                                        5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      US-09-815-242-13785
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOPTWARE: FastSEQ for Windows Version
SEQ ID NO 13785
LENGTH: 320
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Best
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Matches 102; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ORGANISM: Salmonella typhi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Local Similarity
   273
                                     371
                                                                        255
                                                                                                        311
                                                                                                                                           201
                                                                                                                                                                              266
                                                                                                                                                                                                                                                                                     101
                                                                                                                                                                                                              155
                                                                                                                                                                                                                                                                                                                      148
                                                                                                                                                                                                                                              208 VAENNANPRMLIVHEVMGRNCGWLTAATAQEYRKLLDRAEWL--PELGLTRESYBVHAVF
                                                                                                                                                                                                                                                                                                                                                       61 MINR------GGTFLGSAR--FPEFRD------
                                                                                                                                                                                                                                                                                                                                                                                     88 EVRKKAGVLQRFGGSVIGNSRVKLTNVKDCVKRGLVKEGEDPQKVAADQLVKDGVDILHT 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                            33 KKVAILTAGGLAPCLNSAIGSLIERYTEIDPSIBIICYRGGYKGL-----LLGDSYPVTA 87
-IDLLLEGHGGRCVGIQNEQLVHHD-----IIDAIENMK----RPFK--SDW 312
                                                                                                                                                                                                                                                                                                             IGGDDTNTAAADLAAFLARMNYGLTVIGLPKTVDNDVFPIKQSLGAWTAABQGARYFMNV
                                                                                                                                                                                                                                                                                                                                                                                                                          KKIGVLTSGGDAPGMNAAIRGVVR--AALTEGLEVMGIYDGYLGLYEDRMVQLDRYSVSD
                                     CADLAVE----
                                                                        GSPVPYD-
                                                                                                    GQEVPRDAFGHIKLDAVNPGKWFGEQFAQMIGAEKTLVQKSGYFARASASNVDDMRLIKS 370
                                                                                                                                                                           VPEMAIDLEAEAK-----RLREVMDKVDCVNIFVSEGAGVE---AIVAEMQAK 310
                                                                                                                                                                                                              RDTSSSHQRISIV-EVMGRYCGDLTLAAA-----IAGGCEFIVVPEVEFNRE------
                                                                                                                                                                                                                                                                                 iggdgsymgakri-----temgfpcigipgtidndikgtdytigyftalgtvveaidrl
                                                                                                                                           DÍVÁRI KAGIAKGKKHAIVAITÉHMCDVDBLAHFIBKETGRÉTRATVLGHIQRG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                10.5%;
                                 -CAFRESGVIGHDEDNGNVLRAIEFPRIKGGKPFNIDTDW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             .
65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 240.5; DB 9;
Pred. No. 1e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches 122;
                                                                      ----RILASRMGAYA----
                                                                                                                                                                                                                                                                                                                                                      -ENIRAVAIENLKKRGIDALVV 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               129;
                                   417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
                                                                                                                                                                                                                                               265
                                                                                                                                                                                                                                                                                   154
                                                                                                                                                                                                                                                                                                                  207
                                                                                                                                                                                                                                                                                                                                                                                                                            60
```

Search completed: January 29, Job time : 40 secs 2004, 14:43:34

272

254

200